Indian and Northern Affairs Canada

Affaires indiennes et du Nord Canada

YUKON

PLACER MINING INDUSTRY 1978-1982

Canada

85-4041/

COVER: The "Klondike Gold Rush" in 1898 saw thousands of heavily laden individuals climbing the Chilkoot Pass on their trek to Dawson. This same enthusiasm, optimism and work effort, albeit modified, was exhibited in the latest "Gold Rush" that is documented in this volume.

YUKON
PLACER MINING
INDUSTRY 1978–1982

Compiled and Edited

By

R. L. Debicki

Exploration and Geological Services
Northern Affairs Program
Indian and Northern Affairs Canada
Whitehorse, Yukon

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RESUME

Exploitation des placers

De 1978 à 1982, on s'est beaucoup intéressé à l'exploitation des placers. Au cours de cette période, le prix de l'or a brusquement triplé en particulier en 1979 et en 1980. Cet intérêt a diminué quelque peu lorsque le prix de l'or est descendu, en 1981 et en 1982, à moins du double de son prix de 1978.

Le nombre de concessions nouvelles de placers jalonnées au Yukon est passé de 1 047 en 1978 à 2 346 en 1979, à 3 558 en 1980, à 6 978 en 1981 et à 3 896 en 1982. Le nombre de concessions reconnues au Yukon est passé de 4 756 en 1978 à 6 905 en 1979, à 9 981 en 1980, à 15 949 en 1981, et à 15 954 en 1982. Environ 75 p. 100 de l'ensemble reconnu chaque année, se situaient dans le district minier de Dawson.

Le nombre de nouveaux baux de placers jalonnés au Yukon est passé de 225 en 1978 à 432 en 1979, et à 895 en 1980, et a ensuite baissé à 510 en 1981 et à 261 en 1982. Le nombre de baux de placers reconnus au Yukon, qui était de 290 en 1978, s'est élevé à 570 en 1979, et à 1 076 en 1980, puis a baissé à 981 en 1981 et à 500 en 1982. Environ 55 p. 100 de l'ensemble reconnu chaque année, se trouvaient dans le district minier de Dawson.

Des placers ont été exploités entre 1978 et 1982 dans diverses parties du Yukon, soit dans la région de la rivière Sixty Mile, du Klondike, du ruisseau Clear, de Mayo, du chaînon Dawson, de Carmacks, des ruisseaux Livingston et Burwash, et aussi dans la région d'Atlin en Colombie-Britannique. Les gisements aurifères sont composés de gravier alluvionnaire non consolidé datant de la fin du Tertiaire à l'Holocène. La plupart des gisements se trouvent dans des régions n'ayant pas subi l'érosion glaciaire, bien qu'environ 10 p. 100 de l'or récupéré entre 1978 et 1982 proviennent de gisements situés dans des sols d'origine glaciaire. Certains gisements se trouvent dans des sols gelés en permanence. La plupart sont recouverts de gisements plus récents notamment de gravier alluvionnaire de gravier fluvio-glaciaire, d'argile à blocaux, de colluvium et de limon.

Entre 1978 et 1982, on a mené des activités minières dans 288 endroits différents au Yukon. Des travaux de prospection et d'analyse ont été effectués à de nombreux autres endroits. Un échantillonnage massif a eu lieu; et diverses méthodes de forage et techniques sismiques ont été utilisées. Le nombre de gisements exploités a augmenté chaque année; il est passé de 78 en 1978 à 118 en 1979, à 197 en 1980 et à 223 en 1981, et il a ensuite baissé à 215 en 1982. Le nombre de gisements exploités, quel que soit leur importance, a augmenté proportionnellement. En 1982, 75 p. 100 des exploitations minières, soit 162 sur 215, comptaient trois employés ou moins et employaient 360 des 650 personnes travaillant dans ce secteur (55 p. 100). Trente-cinq exploitations comptant chacune 4 ou 5 employés, comptaient 155 personnes et 18 exploitations de 6 emplyés ou plus chacune, employaient 135 personnes. Les méthodes d'exploitation utilisées varient selon les caractéristiques du gisement exploité et l'importance de la mine. Dans la plupart des cas, l'exploitation s'est faite à ciel ouvert, à l'aide de bouteurs à chenilles et de chargeurs à roues. On a également utilisé, quoique plus rarement, des chargeurs à chenilles, des chargeurs-pelles, des chargeurs à racloirs à roues, des pelles mécaniques à chenilles et des bouteurs à roues.

L'extraction et l'abattage hydrauliques ont été pratiqués à certains endroits. Au Yukon, l'exploitation souterraine a eu lieu en deux endroits. Dans un cas, on a utilisé une drague à chaîne à godets.

Tous les systèmes de récupération de l'or utilisés dépendaient de la densité de l'or et de l'action de l'eau pour séparer l'or du gravier. La plupart comportaient l'utilisation d'un genre de sluice. Entre 1978 et 1982, de nombreux dispositifs ont été employés pour séparer les gros cailloux du gravier avant de laver ce dernier aux sluices. Mentionnons, entre autres, les grilles fixes et les oscillatoires, les tamis vibrateurs, les alimentateurs à talon et les trommels.

La production d'or fin des placers du Yukon est passée de 641 655 g (20 630 oz) en 1978 à 873 372 g (28 080 oz) en 1979, à 1 820 334 g (58 526 oz) en 1980 et à 2 479 935 g (79 733 oz) en 1981, et a ensuite baissé à 1 842 355 g (59 234 oz) en 1982. La production totale d'or au Yukon a été de 347 965 585 g (11 187 525 oz) de 1885 à 1982.

Les coûts de l'exploitation minière à la fin de la période allant de 1978 à 1982 on varié de 4 $ à 10,50 $ le m^3 (de 3 $ à 8 $ la verge cube). La valeur de l'or dans les gisements de qualité type se situait entre 7,15 $ et 11,48 $ le m^3 (5,46 $ et 8,78 $ la verge cube) et le prix de l'or était de 487,90 $ CAN. (400 $ É.U.) l'once.

CONTENTS

RESUME

Introduction 1

Acknowledgements 1

STATISTICAL REPORTS BY R.L. Debicki

History of the Placer Mining Industry in Yukon . 2

An Overview of the Placer Mining Industry in Yukon, 1978 to 1982 7

Legislation and Regulations Governing Placer Mining 15

TECHNICAL REPORTS

Placer Deposits: Their Formation, Evaluation, and Exploitation by R.L. Debicki 18

Drilling Techniques and Evaluation of Placer Gold Deposits by Douglas B. Colp 35

Seismic Tests of Placer Deposits in Areas of Permafrost by S.E. Pullan and J.A. Hunter 43

Placer Recovery by W.A. McCarter 46

Marketing Placer Gold by Gordon R. Hilchey ... 50

Hedging Gold Production by Gordon R. Hilchey . 54

PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983, AND DESCRIPTIONS OF PLACER MINING OPERATIONS ACTIVE BETWEEN 1978 AND 1982

Introduction 58

WATSON LAKE (NTS 105 A) 60

WOLF LAKE (NTS 105 B) 61

TESLIN (NTS 105 C) 62

WHITEHORSE (NTS 105 D) 64

LABERGE (NTS 105 E) 66

QUIET LAKE (NTS 105 F) 68

FINLAYSON LAKE (NTS 105 G) 69

MAYO (NTS 105 M) 70

LANSING (NTS 105 N) 76

NASH CREEK (NTS 106 D) 78

DEZADEASH (NTS 115 A) 82

MOUNT ST. ELIAS (NTS 115 B/C) 84

KLUANE LAKE (NTS 115 F/G) 86

AISHIHIK LAKE (NTS 115 H) 91

CARMACKS (NTS 115 I) 92

SNAG (NTS 115 J/K) 96

STEWART RIVER (NTS 115 O/N) 100

McQUESTEN (NTS 115 P) 110

KLONDIKE (parts NTS 115 O/N and 116 B/C) . 122

LARSEN CREEK (NTS 116 A) 161

DAWSON (NTS 116 B/C) 162

DEMARCATION POINT (NTS 117 C/D) 168

REFERENCES TO PLACER CREEKS 170

BIBLIOGRAPHY 184

INDEX 197

PLACER MINING IN YUKON, 1978 to 1982

Introduction

This volume contains reports describing the placer mining industry in Yukon during 1978 to 1982 and follows earlier annual Mineral Industry Reports for Yukon published by the Department of Indian and Northern Affairs, and by the Geological Survey of Canada.

There are two sections in this volume. The first contains reports describing certain aspects of the placer mining industry, while the second contains maps showing the distribution of placer claims and leases, and descriptions of individual mining operations.

Reports in the first section describe the placer mining industry as a whole, and outline regulations and restrictions on placer mining in Yukon. In addition, lists of references to selected creeks in Yukon are also included. Several papers describe the formation of placer deposits, and the exploration, mining, and marketing of placer gold. Some of these reports were presented at the Placer Mining Short Course sponsored by D.I.A.N.D. and the Klondike Placer Miners Association at Whitehorse, April 20 to 22, 1982.

Reports in the second section describe 288 individual mining operations active in Yukon between 1978 and 1982. Information in the reports was derived from field investigations of R.L. Debicki, from records on file at D.I.A.N.D. in Whitehorse, and some information for the years 1978 to 1979 was compiled from the field notes of Dr. D.B. Craig. Each report is keyed to a set of maps which are reductions of the 1:250,000 scale topographic maps. The maps show the distribution of placer claims and leases, as well as the location of each mining operation. Due to the density of mining operations in the Klondike area, a separate map, with less reduction than the others has been prepared for that area. The claim information on the maps derives from the maps of the Regional Manager of Mineral Rights, D.I.A.N.D., Whitehorse, Yukon.

The maps are arranged according to the National Topographic System alphanumeric sequence, and the reports of mining operations follow this order. Thus, each map precedes a section describing placer mining activity within that area. Each report on a property includes a heading with a number keying it to the map, the National Topographic System reference number indicating the 1:50,000 scale map area in which it lies, and its latitude and longitude. The name or names in the heading are those of operators at the site during the time covered by the report, while the years indicate which years during the period 1978 to 1982 there was work done. There are undoubtedly omissions. Some operations where the work done was exploratory or preparatory were omitted on purpose. Other operations where exploratory or preparatory work was done were included because of the large scale of the work. Data was unavailable of some mining operations, and incomplete for others.

The work accepted for assessment credit on placer claims and leases in Yukon by D.I.A.N.D. may be of interest to individuals researching particular areas. Lists of assessment work are published monthly in the circular "North of 60°- Mines and Minerals Statistics."

Exploration and Geological Services Division

The Geology Division office sells topographic, geological, aeronautical, and land-use maps, as well as Geological Survey of Canada publications covering Yukon and adjacent parts of British Columbia and the Northwest Territories. A library of Geological Survey of Canada, B.C. Dept. of Mines, Alaska Bureau of Mines, U.S.G.S. Alaska publications, and geological texts and journals is available for consultation. Open file reports of the Geological Survey of Canada that concern Yukon are available for viewing. Air photos, covering Yukon from latitude 60° to 65°N, are available for use in the office as is the latest catalogue of Yukon air photos from the National Air Photo Library. A current list of good prints of the 1972 - 1977 satellite (LANDSAT) imagery of the Yukon is included in the Air Photo catalogue. The office also has a LANDSAT mosaic of the Cordillera on display and a collection of colour LANDSAT photos of the Yukon.

The H.S. Bostock Core Library, across the street from the Division, contains working quarters equipped with Tyler sieves, diamond saws, a core splitter, a vibrating polisher, rock staining facilities and fume hood. A petrographic microscope with capability for transmitted and reflected light, and a binocular microscope are also situated in the core library. The Division also has McPhar Spectra 44 (four channel) gamma-ray spectro-meter, ultraviolet lamps and two GR-101A scintillometers. The equipment and instruments are available for use by arrangement with the core librarian.

The Division staff consists of the following: J.A. Morin - Chief Geologist and Regional Manager, J.G. Abbott - Minerals Geologist, S. Morison - Placer Geologist, P. Watson and K.J. Grapes - Staff Geologists, V. Klaver - Office Manager, R. McIntyre - Core Librarian and J. Broeren - Secretary. R. Debicki was a term employee during 1982 and worked on a contract basis in 1983.

Acknowledgements

Preparation of this volume has required the efforts of a number of people, including the authors of the individual papers in the first section. Employees of Geology Division, D.I.A.N.D. were involved in various aspects of the preparation of this volume. Jim Morin organized and coordinated its preparation. Ruth Debicki wrote the descriptions of the mining operations in the second section of the volume, and prepared preliminary maps showing the locations of the mining operations. Kate Grapes prepared preliminary maps showing the locations of placer claims and leases, and Susan Acorn prepared the index. Ian Stallabrass, Laurie Butterworth, and Bob Lewis of the Drafting Section of D.I.A.N.D. drafted all the maps charts, and diagrams in this volume. The photographs were prepared from the coloured slides by Kerrisdale Cameras Ltd. of Vancouver, B.C. All written material was processed by Judy Pura, Jan Lampman, and Cindy Bachman at J.D. Word Processing Services Ltd. of Richmond, B.C. Arrangements for publication of the manuscript were made by Patti Smillie of Public Affairs Section, D.I.A.N.D.

HISTORY OF THE PLACER MINING INDUSTRY IN YUKON

Yukon is famous for the stampede of prospectors to the Klondike in 1898 after news of the rich placer deposits discovered in the area reached them. Placer mining had, however, been carried on in the territory for many years prior to the gold rush.

The first miners were undoubtedly Indians who recovered native copper from Kletsan Creek at the headwaters of the White River. Hudson's Bay Company explorer Robert Campbell reported gold at Fort Selkirk in 1850. Prospecting parties moved into Yukon in 1872, after activity in the Cariboo placer district to the south had cooled. That year, the party of Arthur Harper, Leroy (Jack) McQuesten, and Albert Mayo reported gold "colours" on the Liard River, "fair prospects" on the Peel River, "colours" on the Porcupine River, and "colours everywhere" on the Yukon River.

In 1874, coarse gold was discovered for the first time in the territory at Sayyea Creek. The deposit was not rich by the standards of the day: four men worked 115 days to recover 77 ounces of gold. At the same time, other parties prospected on the Frances, Yusesyu, and Hyland Rivers, but found no viable deposits. McQuesten and Mayo built a trading post at Fort Reliance, five miles downstream from the present Dawson City that year.

Access to Yukon was made easier 1880, when the Chilkat Indians were persuaded to allow prospectors to cross the Chilkoot pass. Between 1880 and 1887, prospecting activity increased. Numerous "bar" deposits were found on the Yukon, Pelly, Teslin, and Stewart Rivers. Near the end of 1886, coarse gold was found on the Fortymile River. In 1887, there were more than 300 miners on the Fortymile, and bar miners were busy in other areas as well. The mining industry in the territory was finally firmly established.

Veteran prospector Robert Henderson arrived during the summer of 1894. Finding the Fortymile and Sixty Mile Rivers too crowded, he decided to prospect the Indian River. He systematically prospected the Indian and its tributaries in 1894 and 1895. He was not the only prospector exploring new territory: in 1895 miners working their way up the Stewart and McQuesten Rivers discovered gold on Haggart Creek.

Henderson spent the winter of 1895-1896 working on Quartz Creek. Meanwhile, 350 miners were active on Miller, Glacier, and Bedrock Creeks. During the summer of 1896, Henderson made a trip to Ladue's post at Ogilvie for supplies. The water in the Indian River was low, and he knew it would be almost impossible to proceed up that stream, so he went down the Yukon to its confluence with the Klondike. There, he found George Carmack and two Indians, "Skookum Jim" and "Tagish Charlie", who were fishing for salmon. In accordance with custom, Henderson announced a discovery he had made on Gold Bottom Creek, and invited Carmack, but not the Indians, to stake on the creek.

Carmack reluctantly promised to visit Gold Bottom Creek, as he was more interested in logging than in prospecting. Skookum Jim saw colours in Bonanza Creek near Sourdough Gulch on a trip to look for good trees, but Carmack was not influenced by Jim's enthusiasm. A few weeks later, however, he decided to visit Henderson and do some prospecting. Their visit was a disappointment, and Carmack, Jim, and Charlie returned to Bonanza Creek. There, on August 16th, they decided to stake.

The trio proceeded to Forty Mile to record their claims. When news of the discovery became known to the miners in the Forty Mile district, they all stampeded to Bonanza Creek. Within 3 months, 500 claims were staked. Extensive prospecting commenced, and in a few months the remarkable wealth in the gravels of Bonanza and Eldorado Creeks was revealed.

It was almost a year before news of the strike reached the "outside". When it did, thousands of gold seekers immediately started for the Klondike, and the "Klondike Gold Rush" was on.

Mining procedures to about 1901 were labour-intensive. The cost of bringing machinery 4,000 miles by steamship precluded its use. Heavy machinery became available in 1900 when the White Pass Railway was

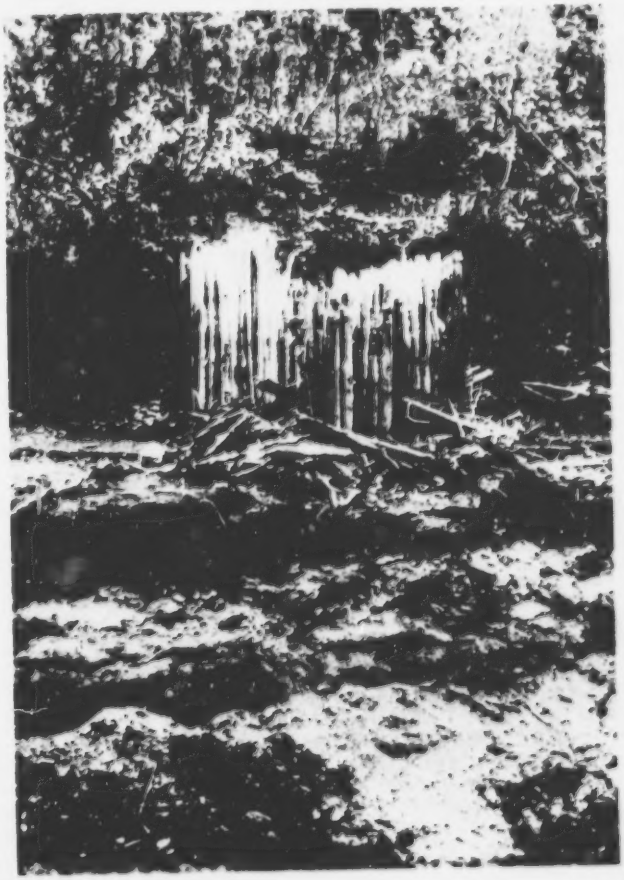

Figure 1: These poles line a shaft at the site of abandoned underground workings on Gay Gulch, Klondike area.

completed to Whitehorse. With the exception of a small steam dredge put into production on Cassiar Bar below Hootalinqua in 1899, however, dredges did not appear in the territory until 1905.

While the Klondike area held the attention of the mining fraternity and the general public, the prospectors were not idle. In 1896, Jack Dalton found gold in the Dezadeash area. Gold was also found that year in Johnson Creek, a tributary of the McQuesten River. In 1898, Scroggie, Barker, Henderson, and Clear Creeks were discovered. Duncan Creek and Dublin Gulch in the Mayo area were found, Hayes Creek in the Dawson Range was found, and Alder Creek in the Dezadeash area was found. Additional discoveries were made each year to 1905, and have been made sporadically since then.

The dredges and hydraulic mining operations in the Klondike were the mainstay of the territory's economy between 1900 and 1933. Then in January, 1934, the U.S. government set the price of gold at $35.00 per ounce, almost double the existing price. A new wave of prospectors rushed to the Yukon.

Mining activities were reduced with the outbreak of war in 1939. By the end of the war, bulldozer mining had become common, but the cost of labour and supplies had risen to the extent that most of the creeks could no longer be mined profitably. Gold mines in all areas of Canada were closing by the end of the 1940's when the federal government introduced a subsidy on gold production. Most placer mines in the territory took advantage of the subsidy until the rise of the gold price in the early 1970's.

In the mid 1960's, most placer operations ceased. Even Yukon Consolidated Gold Corporation shut the last of its dredges in 1966. A handful of miners continued to work, but most operated on a very small scale.

The rising price of gold in the early 1970's created new interest in placer mining. As the price continued to increase in the late 1970's, staking and mining activity increased accordingly. Activity peaked in 1980 and 1981, and then slumped in 1982 after significant declines in the price of gold during 1981 and 1982.

YUKON CREEKS ON WHICH BASELINE SURVEYS HAVE BEEN DONE

Stream	Tributary to	Date	Surveyor	Field Book	Plan	Microplan
Adams Creek	Bonanza Creek	1901	McPherson		12066	2796
Agate Creek	Barker Creek	1906	Gibbon	19600	34670	3899-902
Alberta Creek	Walhalla Creek	1912	Kitto	19603	34676	2476
Allgold Creek	Klondike River	1902	Gibbon	30336-39	9824	2809
American Gulch	Bonanza Creek	1901	McPherson		12069	2795
Back Creek	Nisling River	1912	Dickson	12875	20050	2001
Barker Creek	Stewart River	1906	Gibbon	19600	34669-70	2477,3899-02
Barlow Creek	Clear Creek	1913	Kitto	19598	34673	2517
Barney Pup	Clear Creek	1905	Gibbon	11996	18089	3043-44
Battleford (Edmonton) Creek	Mayo Creek	1904	McPherson		11490	3414
Bear Creek	Klondike River	1902	Gibbon	30329-33	9825	2810
Bedrock Creek	Sixtymile River	1907	Gibbon	11680	17241	2454-56
Belcher Gulch	Klondike River	1907	Gibbon	11683	17319	2794
Beliveau Creek	Duncan Creek	1903	Rinfret		10178	3447
Big Gold Creek	Sixtymile River	1907	Gibbon	11681	17241	2454-6
Bismark Creek	Montana Creek	1902	McPherson	30314-18	10179	2483-84
Black Creek	Montana Creek	1902	McPherson	30315,17	10179	2483-84
Black Hills Creek	Stewart River	1901	Gibbon	11994	9542	2485-86
Black Hills Creek	Stewart River	1908	Gibbon	11994-95	18090	2453
Blueberry Creek	Thistle Creek	1902	McPherson	30324	10390	2457-58
Bonanza Creek	Klondike River	1897	Ogilvie		8284	3865
Bonanza Creek	Klondike River	1901	McPherson		10285	2799
Bonanza Creek	Klondike River	1901	McPherson		10294	2800
Bonanza Creek	Klondike River	1933	Dickson	21750		7567-78
Bonanza Creek	Klondike River	1971	McDonald		58479	
Bonanza Creek	Klondike River	1979	Brennan		67118	9841
Bonanza Creek	Klondike River	1981	Aucoin		68163	3687
Boucher Creek	Sixtymile River	1902	Cautley		9558	7707
Boulder Creek	Bonanza Creek	1898	Gibbon		9603	2818
Bourdeleau (37) Gulch	Hunker Creek	1902	Cautley		9558	7707
Box Creek	Steele River	1902	McPherson	30314	10179	
Bullion Creek	Slims River	1904	Dickson	7856		7757
Burwash Creek	Kluane River	1906	Dickson	9092	12759-61	1702-3, 2819
Butler Gulch	Boucher Creek	1902	Cautley		9558	7707
Cabin Creek	Nansen Creek	1912	Dickson	12875	20053	1712-13
California Gulch	Bonanza Creek	1902	McPherson	30315-17	10179	2483-84
California Creek	Sixtymile River	1914	Kitto		34674	2753-84
Caribou Creek	Dominion Creek	1904	Gibbon	7857		7710-11
Cascade Creek	Mayo Lake	1904	McPherson		11491	2561
Center Creek	Nisling River	1912	Dickson	12875	20053	1712-13
Childs Gulch	Black Hills Creek	1908	Gibbon	11995	18090	2453
Christal Creek	McQuesten River	1903	McPherson		10239	3417
Clarke Creek	Scroggie Creek	1912	Kitto	19603-04	34676	3476
Clear Creek	Stewart River	1905	Gibbon	11996	18089, 91	3052-3/3043-4
Clear Creek	Stewart River	1913	Kitto	19598	34673	
Conglomerate Creek	Montana Creek	1902	McPherson	30314,16,18	10179	2483-84
Cottoneva Creek	S. Big Salmon River	1902	McPherson	30346	10359	1726
Courtland Creek	Nansen Creek	1912	Dickson	12875	20053	1712-13
Dago Gulch	Hunker Creek	1907	Green	9102		2822
Dion Gulch	Yukon River	1908	McPherson	11657		7748
Discovery Gulch	Black Hills Creek	1908	Gibbon	11994	18090	2453
Dolly Creek	Nansen Creek	1912	Dickson	12875	20053	1712-13
Dome Creek	Nisling River	1912	Dickson	12875	20053	2001
Dominion Creek	Indian River	1900	Cote		9172	4643
Dominion Creek	Indian River	1902	Gibbon	30331,3	10180	2770
Dominion Creek	Indian River	1918	Hawkins	15614		2813
Dominion Creek	Indian River	1981	Welter		68166	3688
Dublin Gulch	Haggart Creek	1903	McPherson		10289	3054
Dublin Gulch	Haggart Creek	1980	Parnell			
Duncan Creek	Mayo River	1903	McPherson		10177	3418
Duncan Creek	Mayo River	1903	Rinfret		10178	3447
Duncan Creek	Mayo River	1903	Barwell		58577	
Edmonton (Battleford) Creek	Mayo Lake	1904	McPherson		11490	3414
Eight Pup	Mayo Lake	1901	Gibbon		9608,9613	2802,7
Eighty Pup	Hunker Creek	1901	Gibbon		9609	2803
Eldorado Creek	Bonanza Creek	1901	McPherson		9614-15	2808
Eldorado Creek	Bonanza Creek	1901	McPherson		9604	2873-74
Eldorado Creek	Bonanza Creek	1905	Gibbon	11996	18091	3052,53

Stream	Tributary to	Date	Surveyor	Field Book	Plan	Microplan
Eldorado Creek	Bonanza Creek	1933	Dickson	21750	39900	
Eldorado Creek	Bonanza Creek	1982	Aucoin			
Eliza Creek	Nansen Creek	1912	Dickson	12875	20052	2001
Eureka Creek	Indian River	1902	McPherson	7855		7709
Eureka Creek	Indian River	1902	McPherson		55028	7708
Eureka Creek	Indian River	1902	McPherson	30335	10614	2482
Eureka Creek	Indian River	1900	Cote		9394	2827-8
Examiner Gulch	Bonanza Creek	1908	McPherson	11657		7748
Falconer Gulch	Yukon River	1908	McPherson	11657		7748
Fifteen Pup	Last Chance Creek	1901	Gibbon		9613	2807
Fifty-one Pup	Barker Creek	1906	Gibbon	19600	34669	2477
Fish Creek	Klondike River	1903	Gibbon	7858	11494	2801
Fisher Creek	Montana Creek	1902	McPherson	30315	10179	2483-84
Five Mile Creek	Sixtymile River	1914	Kitto	19598	34674	2753-54
Flat Creek	Klondike River	1904	Gibbon	7857		7710-11
Forty Pup	Duncan Creek	1903	McPherson		10177	3418
Fourth of July Creek	Jarvis River	1913	Dickson	19598	34666-68	1863-64
Fox Gulch	Bonanza Creek	1901	McPherson		12069	2795
French Gulch	Eldorado Creek	1901	McPherson		9615	2808
Gay Gulch	Eldorado Creek	1901	McPherson		9614	2808
Gauvin Gulch	Bonanza Creek	1901	McPherson		12067	2796
Glacier Creek	Sixtymile River	1901	Dumais	9545		4443
Glacier Creek	Sixtymile River	1907	Gibbon	11681	17241	2454-56
Gold Bottom Creek	Hunker Creek	1901	Gibbon		9612	2805-6
Gold Run Creek	Dominion Creek	1902	McPherson	30334	10181	2797-98
Gold Run Creek	Dominion Creek	1981	Welter		68166	3688
Goring Creek	Klondike River	1910	McPherson	11659		7560
Granite Gulch	Boucher Creek	1902	Cautley		9558	7707
Guysboro Gulch	Klondike River	1907	Gibbon	11683	17319	2794
Haggart Creek	McQuesten River	1903	McPherson		10289	3054
Haggart Creek	McQuesten River	1980	Parnell			
Hattie Gulch	Hunker Creek	1907	Gibbon	11683	17319	2794
Henry Gulch	Hunker Creek	1901	Gibbon		9607	2802
Hester Creek	Hunker Creek	1901	Gibbon		9611	2804
Henderson Creek	Yukon River	1901	Gibbon		9542	2485-86
Highet Creek	Minto Creek	1904	McPherson		11489	3055
Hodgen Creek	Montana Creek	1902	McPherson	30314-15	10179	2483-84
Homestake Gulch	Bonanza Creek	1901	McPherson		9847	2811
Hunker Creek	Klondike River	1901	Gibbon		9606,7,11	2802-4
Hunker Creek	Klondike River	1902	Gibbon	30331	10180	2770
Hunker Creek	Klondike River	1977	Koepke		65451	9623
Hunker Creek	Klondike River	1902	Gibbon		8636,9824	2831-32,2809
Hunker Creek	Klondike River	1967	Holt		53536	
Hunker Creek	Klondike River	1980	Aucoin		67557	944
Hunker Creek	Klondike River	1982	Aucoin			
Huot Gulch	Boucher Creek	1902	Cautley		9558	7707
Indian River	Yukon River	1900	Cote		9172	4643
Indian River	Yukon River	1934	Dickson	21911	39217-18	2474-75
Indian River	Yukon River	1936	Dickson	22085	39321-22	692
Indian River	Yukon River	1938	Dickson	24271		7987
Indian River	Yukon River	1981	Koepke			
Indian River	Yukon River	1981	Welter		68166	3688
Iron Creek	Barker Creek	1906	Gibbon	19600	34669-70	2477,3899-902
Isaacs Gulch	Flat Creek	1904	Gibbon	7857		7710-11
Italian Creek	Montana Creek	1902	McPherson	30315,17	10179	2483-84
Jackson Gulch	Klondike River	1980	Aucoin		67132	9845
Jarvis River	Kaskawulsh River	1913	Dickson	19598	34666-68	1863-64
Jones Gulch	Black Hills Creek	1908	Gibbon	11995	18090	2453
Keystone Creek	Mayo Lake	1903	McPherson		10240	3417
Kitchener Creek	Steele River	1902	McPherson	30314	10179	2483-84
Klondike River	Yukon River	1902	White-Fraser	(part of B/L only)	54370	
Klondike River	Yukon River	1980	Aucoin		67133	9846
Lake Creek	S. Big Salmon River	1902	McPherson	30346	10359	1726
Last Chance Creek	Hunker Creek	1901	Gibbon	30331	9605,8,10,13	2802,3,7
Ledge Creek	Mayo Lake	1904	McPherson		11492	2560
Lepine Creek	Rock River	1903	Gibbon	7858,30350	11494	2801,8018
Lightning Creek	Duncan Creek	1903	McPherson		10177(55071)	3418(7727)
Lightning Creek	Duncan Creek	1903	Barwell		58577	
Lindow Creek	Bear Creek	1902	Gibbon	30329,32,33	9825	2810
Lion Gulch	Caribou Creek	1904	Gibbon	7857		7710-11
Little Blanche Creek	Quartz Creek	1909	McPherson	11660		1425

Stream	Tributary to	Date	Surveyor	Field Book	Plan	Microplan
Little Skookum Gulch	Bonanza Creek	1901	McPherson		9847	2811
Livingstone Creek	S. Big Salmon River	1902	McPherson	30346	10359	1726
Lovett Gulch	Bonanza Creek	1901	McPherson		12069	2795
Lovett Gulch	Bonanza Creek	1980	Brennan		67265	mylar
Lucky Creek	Allgold Creek	1902	Gibbon		9824	2809
Magnet Gulch	Bonanza Creek	1901	McPherson		12069	
Mariposa Creek	Scroggie Creek	1912	Kitto	19604	34676	2476
McKay Gulch	Bonanza Creek	1901	McPherson		9847	2811
McRae Gulch	Highet Creek	1904	McPherson		11489	3055
McRae Gulch	Highet Creek	1906	Gibbon	19600	34669-70	2477,3899-902
Miller Creek	Sixtymile River	1909	McPherson	11658		7436
Miller Creek	Sixtymile River	1981	Aucoin		67918	2463
Mint Gulch	Hunker Creek	1901	Gibbon		9606	2802
Minto Creek	Mayo River	1912,14	Kitto	17622	31763,65	3041-42
Montana Creek	Indian River	1902	McPherson	30314-16	10179	2482-84
Moose Creek	Fortymile River	1907	Gibbon	9545		4443
Nansen Creek	Nisling River	1912	Dickson	12875	20051-53	2001,1712-14
Nelson Gulch	Sixtymile River	1902	Cautley		9558	7707
Newbauer Creek	Nisling River	1912	Dickson	12875	20053	1712-13
Nigger Jim Gulch	Bonanza Creek	1901	McPherson		9847	2811
Nineteen Pup	Bonanza Creek	1901	McPherson		9847	2811
No Name Creek	Montana Creek	1902	McPherson	30314	10179	2483-84
Nugget Gulch	Eldorado Creek	1901	McPherson		9614	2808
O'Neill Gulch	Bonanza Creek	1901	McPherson		9847	2811
Parent Creek	Duncan Creek	1903	Rinfret		10178	3447
Preacher Creek	Barker Creek	1906	Gibbon	19600	34669-70	2477,3899-902
Quartz Creek	Indian River	1900	Cote		9172	4643
Quartz Creek	Indian River	1980	Welter		68165	mylar
Rabbit Gulch	Hunker Creek	1907	Gibbon	11683	17319	2794
Randler Gulch	Boucher Creek	1902	Cautley		9558	7707
Rudolph Gulch	Highet Creek	1904	McPherson		11489	3055
Rusk Creek	Nisling River	1912	Dickson	12875	2005	2001
Scroggie Creek	Stewart River	1912	Kitto	19603	34676	2476
Sharpe (Stevens) Creek	Scroggie Creek	1912	Kitto	19604	34676	2476
Shaw Creek	Nansen Creek	1912	Dickson	12875	20052	2001
Sixtymile River	Yukon River	1907	Gibbon	11680	17241	2454-56
Sixtymile River	Yukon River	1914	Dickson	19598	34663-65	2755-57
Sixtymile River	Yukon River	1914	Kitto	19598	34674	2753,54
Sixtymile River	Yukon River	1981	Aucoin		67918	2463
Skookum Gulch	Bonanza Creek	1901	McPherson		9847	2811
Slate Creek	Nansen Creek	1912	Dickson	12875	20049	2001
Sock (Rock) Creek	Klondike River	1903	Gibbon		11494	2801
Spring Gulch	Bonanza Creek	1901	McPherson		9847	2811
Steele River	Montana Creek	1902	McPherson	30314,16,17	10179	2483-84
Steep Creek	Mayo Lake	1904	McPherson		11493	3413
Stevens Creek	Scroggie Creek	1912	Kitto	19603	34676	2476
Stowe Creek	Montana Creek	1902	McPherson	30314,16	10179	2483-84
Sulphur Creek	Dominion Creek	1912	Kitto	12294	8599-600	7561
Summit Creek	S. Big Salmon River	1902	McPherson	30346	10359	1726
Summit Creek	Nisling River	1912	Dickson	12875	20053	1712-13
Tenmile Creek	Sixtymile River	1912	Kitto	19602	34675	2477
Thirteen Gulch	Eldorado Creek	1916	Brownlee	14861		2812
Thistle Creek	Yukon River	1902	McPherson	30323-24	10390	2457-58
Trail Gulch	Bonanza Creek	1901	McPherson		12069	2795
Twelvemile Creek	Sixtymile River	1914	Kitto	19598	34674	2753-54
Twenty Gulch	Hunker Creek	1907	Gibbon	11683	17319	2794
Twenty-one Gulch	Hunker Creek	1907	Gibbon	11683	17319	2794
Vermont Creek	Steele River	1902	McPherson	30318	10179	2483-84
Victoria Gulch	Bonanza Creek	1901	McPherson		12068	2796
Victoria Creek	Nisling River	1912	Dickson	12875	20048	1715
Webber Creek	Nansen Creek	1912	Dickson	12875	20053	1712-13
Walhalla Creek	Scroggie Creek	1912	Kitto	19604	34676	2476
Williams Creek	Duncan Creek	1903	McPherson		10177	3418
Williams Creek	Duncan Creek	1903	Rinfret		10178	3447

AN OVERVIEW OF THE PLACER MINING INDUSTRY IN YUKON, 1978 to 1982

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The period 1978 to 1982 was one of intense new interest, rapid growth, and finally economic reassessment in the Yukon placer mining industry. All aspects of the industry were affected.

Staking Activity

Placer staking activity was at a much higher level than for many years prior to 1978. Figure 1 shows the count of new placer claims staked in the territory each year from 1972 to 1982. Figure 2 shows the count of new placer leases staked in the territory each year from 1972 to 1982.

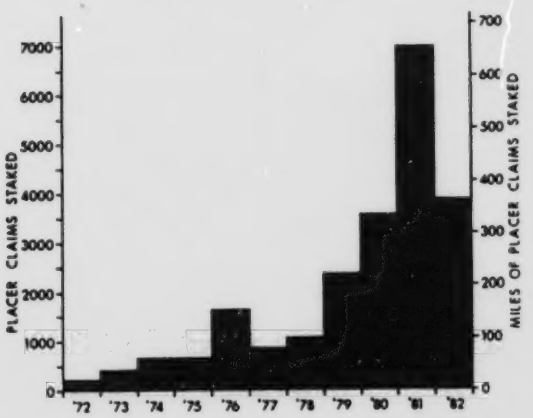


Figure 1: Count of new placer claims staked each year from 1972 to 1982.

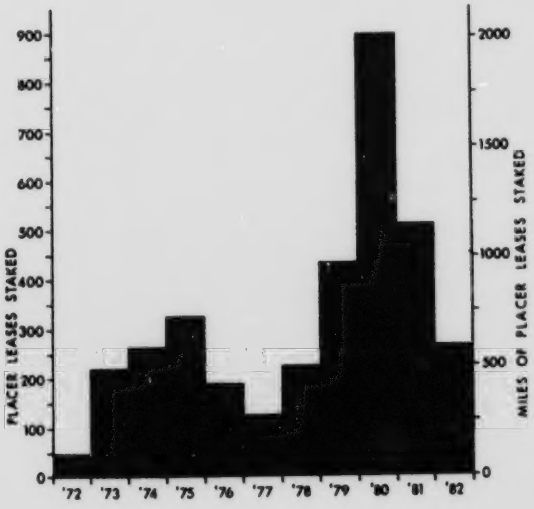


Figure 2: Count of new placer leases staked each year from 1972 to 1982.

In addition to significant increases in the numbers of new placer claims and leases staked during the past five years, there have also been significant increases in the numbers of claims and leases maintained in good standing. Figure 3 shows the count of placer claims in good standing each month during the years 1978 to 1982.

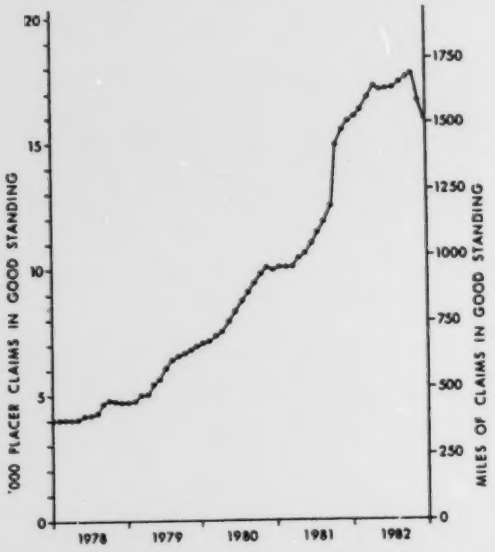


Figure 3: Count of placer claims maintained in good standing from 1972 to 1982.

The count of placer leases in good standing each month during the years 1978 to 1982 is shown in Figure 4. As placer leases may be any distance up to 8 km (5 miles) long, the count of leases does not necessarily indicate the total length of the leases staked. Several groups of leases totalling several hundred km (miles) in length each were examined, and an average length of 3.6 km (2.25 miles) per lease was calculated. That number was also used to prepare Figure 4.

Trends shown on Figures 1 and 2, and 3 and 4 are interrelated. The sharp increase in the counts of claims staked, and in good standing in late 1980 and early 1981 is due in large part to the transfer of leases to claims. This is matched by a corresponding decline at the same time in the count of placer leases in good standing.

Yukon Placer Mining, 1978-82, p. 7-14

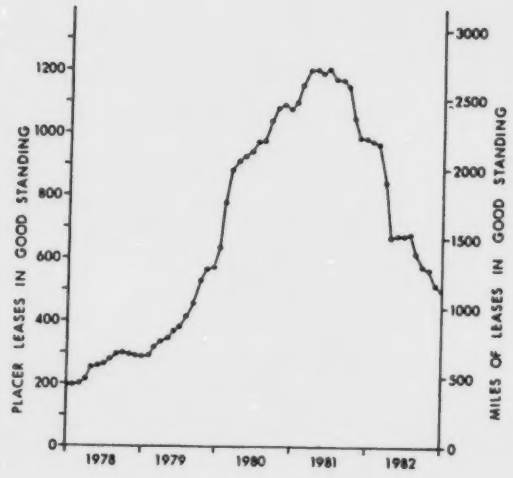


Figure 4: Count of placer leases maintained in good standing from 1978 to 1982.

Figure 5 includes the information shown in both Figures 3 and 4. The count of placer claims in good standing was converted to kilometers (miles) using an average length of 150.9 metres (495 feet) per claim. The average length of 3.6 km (225 miles) per lease was also used. Figure 5 shows a rapid increase in the total km (miles) of placer claims and leases in good standing from 1334 km (834 miles) in January 1978, to 5928 km (3705 miles) in December 1981. From December 1981, the number of claims and leases in good standing dropped to 4197 km (2623 miles) in December 1982.

The data used to prepare Figures 1 to 5 are summarized in Tables 1 and 2. The counts listed for each year are as of December 31.

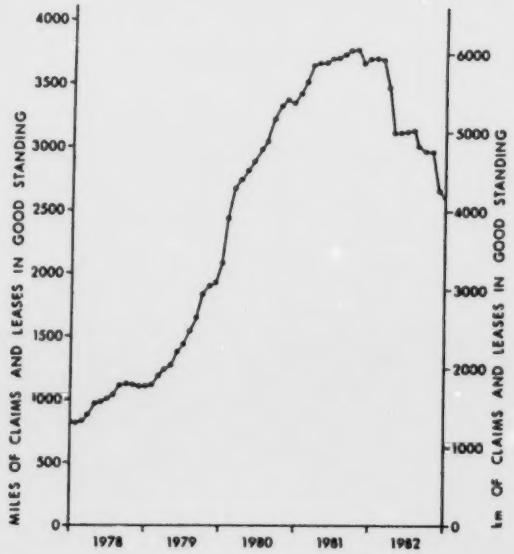


Figure 5: Total km (miles) of placer claims and leases in good standing from 1978 to 1982.

Table 1: Count of Placer Claims in Yukon, 1978 - 1982

Mining District	Claim Status	Year 1978	1979	1980	1981	1982
Dawson	New Staking	693	1976	2404	5314	2008
	Good Standing	3630	5476	7548	12320	11077
Mayo	New Staking	272	208	376	572	674
	Good Standing	527	734	1137	1595	2137
Watson Lake	New Staking	2	6	113	42	65
	Good Standing	42	15	106	83	80
Whitehorse	New Staking	80	156	646	1050	1149
	Good Standing	557	680	1190	1951	2660
Total	New Staking	1047	2346	3558	6978	3896
	Good Standing	4756	6905	9981	15949	15954

Table 2: Count of Placer Leases in Yukon, 1978 - 1982

Mining District	Claim Status	Year 1978	1979	1980	1981	1982
Dawson	New Staking	120	234	460	276	145
	Good Standing	158	304	591	532	349
Mayo	New Staking	48	73	157	80	21
	Good Standing	66	102	137	115	37
Watson Lake	New Staking	13	36	47	12	24
	Good Standing	14	43	66	28	34
Whitehorse	New Staking	44	89	231	142	71
	Good Standing	52	121	282	306	80
Total	New Staking	225	432	895	510	261
	Good Standing	290	570	1076	981	500

The cause of the rapid increase in the counts of new claims and leases staked, and in the km (miles) of placer claims and leases in good standing is shown in Figure 6. The km (miles) of claims and leases in good standing increased gradually in 1978 and early 1979 along with the gradual increase in the price of gold. When the gold price increased dramatically in late 1979 and early 1980, the km (miles) of claims and leases jumped also.

The price of gold was obviously decreasing by early 1981. The km (miles) of claims and leases remained nearly constant until early 1982, although the counts of each type of disposition changed. The km (miles) of claims and leases then began to decline as claims and leases expired, and as leases continued to be transferred to claims. The price of gold had not risen sufficiently from its low in May, 1982 by December, 1982 to halt the decline in the km (miles) of placer dispositions maintained in good standing.

Map areas having placer claims or leases on 1:250,000 scale scale maps are indicated in Figure 7. Reductions of these 1:250,000 scale maps showing the distribution of claims and leases are included in the second section of this report.

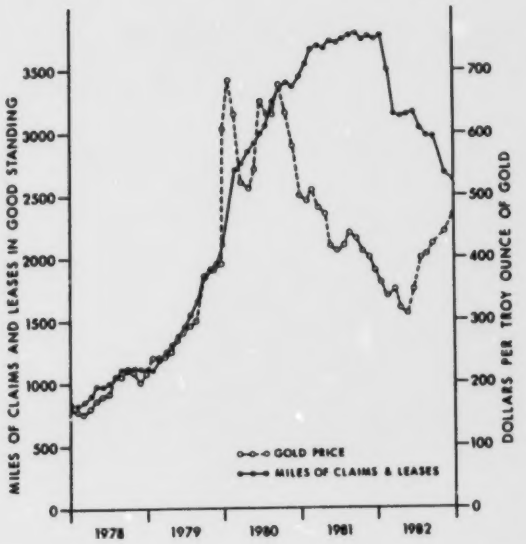


Figure 6: Total km (miles) of placer claims and leases in good standing, and the price of gold from 1978 to 1982.

Mining Activity

Placer mining activity in Yukon increased along with staking activity during the period 1978 to 1982. An indication of the increased activity is the counts of water use authorizations granted each year for placer mining purposes. Those counts are listed in Table 3 along with counts of mining operations active each year, and of employees at those operations. The number of mining operations and employees are not exact. Some mining operations active for only very limited time periods are not included. Small testing, rather than mining, operations are not included. Some operations change significantly in size during the operating season. Although not exact, the numbers nevertheless provide an indication of the scale of the placer mining industry in Yukon.

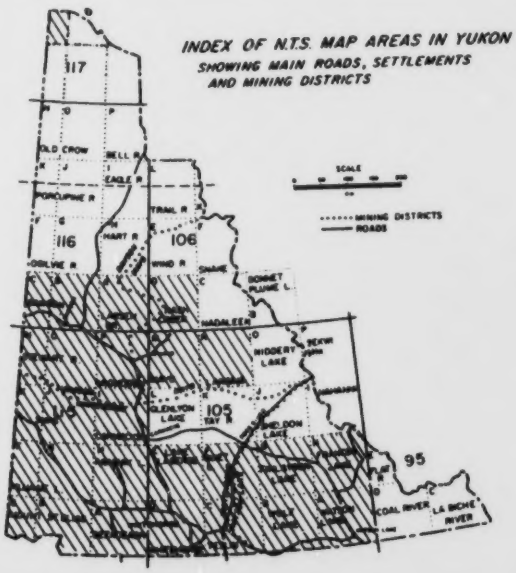


Figure 7: Map areas in which 1:250,000 scale maps have placer claims or leases are shaded on this index map. Placer claims and leases are distributed across most of the territory.

Table 3: Mining Activity in Yukon, 1978 - 1982

Year	Water Use Authorizations	Count of Mining Operations	Count Of Employees
1978	128	78	335
1979	194	118	489
1980	317	197	788
1981	365	223	781
1982	356	215	650

Along with the increase in the number of mining operations as the price of gold rose, there was a proportional increase in the number of large mining operations. The number of large mining operations decreased disproportionately, however, as the price of gold fell.

Table 4: Proportion of Large Mining Operations in Yukon, 1978 - 1982

Year	Count of Mining Operations	Count With More Than 10 Employees	Large Mining Operations as a % Total
1978	78	5	6%
1979	118	7	6%
1980	197	12	6%
1981	223	15	7%
1982	215	8	4%

The majority of placer mining operations had three employees or less. The counts of operations and employees at them in 1982 shown in Table 5 illustrate the preponderance of small, usually family owned and operated mines.

Table 5: Distribution of Employees of Yukon Mines, 1982

Size of Operations	Count of Operations	Count of Employees
3 employees or less	162	360
4 employees	20	80
5 employees	15	75
6 employees or more	18	135
Total	215	650

Employees counted in the above tables are direct employees only. They do not include employees of support industries such as machinery, fuel, and food suppliers, and refiners. One to two jobs in support industries are generally considered to result from every job in a primary industry such as mining.

Map areas having placer mining operations on 1:250,000 scale maps are indicated in Figure 8. Reductions of these 1:250,000 scale maps showing the locations of the placer mining operations and descriptions of the operations are included in the second section of this report.

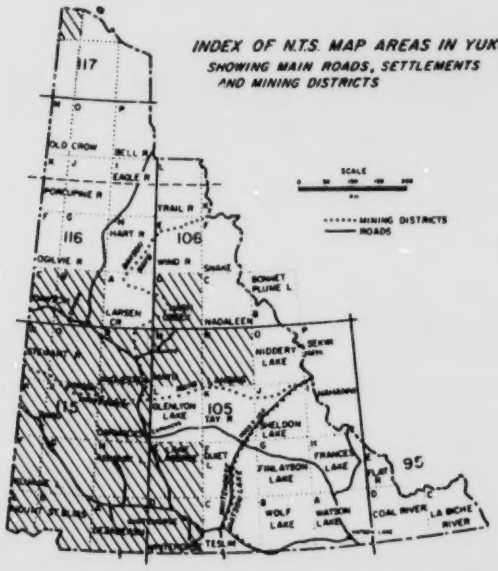


Figure 8: Map areas in which 1:250,000 scale maps have placer mining operations are shaded on this index map.

Placer Gold Production

When recovered from placer deposits, gold is not "pure". It is a natural allow of gold with silver and minor amounts of other metals. The gold content of crude or raw gold is called fineness. It is usually expressed as a three digit number representing parts per thousand of gold. Finenesses reported for gold from Yukon creeks range from 615 to 946. From 1.06 to 1.63 ounces (32.9 to 50.6 grams) of crude gold may be required to supply 1.00 ounce (31.1 grams) of pure gold. The fineness of crude gold is as important as its weight in determining its value. A list of finenesses reported for gold from Yukon creeks is given in Table 6.

The recorded production of gold from Yukon deposits since 1885 has been 11,187,525 ounces (347,965,585 grams) valued at $384,290,088. Much of the gold was recovered when the price of gold was $15. per ounce. If all the production has brought the price at the date of this report, approximately $500 U.S. per ounce, it would have been valued at $6,821,661,600.

Table 6: Fineness of Yukon Placer Gold

Creek	Fineness
Adams Gulch	615-746
Allgold Creek	858
American Gulch	864
Andersen Creek (Fortymile Area)	720-728
Andersen Creek (Mayo Lake Area)	840
Ballarat Creek	852
Barker Creek	793-900
Bear Creek	644-746
Big Gold Creek	847-854
Black Hills Creek	750-855
Bonanza Creek Benches	
- American Hill	864
- Cheechako Hill	750-785
- King Solomon Hill	785-800
- Trail Hill	800-805
Bonanza Creek - Upper	809-827
- Middle	781
- Lower	739-798
Boulder Creek	800
Burwash Creek	871-876
Bullion Creek	871
Canadian Creek	864-883
Canyon Creek	825
Caribou Creek	816-840
Claffey Pup	750
Clear Creek	828-860
Davidson Creek	840
Dominion Creek - Upper	805-832
- Middle	817-849
- Lower	816-840
Dublin Gulch	860-923
Duncan Creek	792-802
Eighty Pup	797
Eldorado Creek Benches	
- Gold Hill	768
Eldorado Creek	733-803
Eureka Creek	677-745
Fortymile River	814-820
French Gulch	631-676
Gay Gulch	780
Gauvin Gulch	664
Glacier Creek	830-860
Gold Bottom Creek	780-800
Gold Run Creek	848-878
Goring Creek	738
Haggart Creek	885-895
Henderson Creek	725-730
Henry Gulch	605-650
Highet Creek	820-845
Homeshake Gulch	663
Hunker Creek Benches	
- Dago Hill	798-859
- Paradise Hill	735-802
Hunker Creek - Lower	701-726
- Middle	725-820
- Upper	798-859
Independence Creek	780-794
Indian River	843
Irish Gulch	624-742
Jackson Gulch	829-842
Johnson Creek	760-820
Kirkman Creek	860-896
Lake Creek	895
Last Chance Creek	683-832
Ledge Creek	808-820
Lightning Creek	830
Livingstone Creek	880
Log Cabin Creek	850-895
Lombard Pup	860
Lovett Gulch	808-836
Little Blanche Creek	658
Mariposa Creek	900
Matson Creek	776
Miller Creek	827-857
Mint Gulch	851
Minto Creek	827-835
Montana Creek	770
Monte Cristo Gulch	784-796
Moose Creek (Fortymile Area)	855
Mooseharn Range	820
Oro Grande Gulch	775
Quartz Creek	732-795
Ready Bullion Creek	710-717
Scroggie Creek	900-905
Skookum Gulch	605
Sixtymile River	810
Steep Creek	931-946
Stewart River	837-850
Sulphur Creek - Upper	820-832
- Middle	790-813
- Lower	823-832
Squaw (Dollis) Creek	834
Ten Mile Creek	830-845
Thistle Creek	848-895
Thunder Gulch	790-825
Victoria Gulch	807-820

As indicated in footnotes to Table 7, the recorded production of gold is based mainly on records of payments of a small royalty on gold. Raw gold used in jewellery is not subjected to the royalty. Gold which remains in Yukon is not subjected to royalty and, since producers are "on their honour" to report gold removed from Yukon and pay the royalty, it is generally assumed that additional gold is removed from the territory without having had royalty paid on it and without having been recorded. Production figures therefore indicate only minimum production.

Royalty records were used to prepare Figure 9, which shows monthly production rates of crude gold from 1978 to 1982. The figure illustrates the seasonal nature of placer mining, and also shows the increase in gold production in 1980, 1981, and 1982 compared to 1978 and 1979.

Figure 10 shows the production of crude placer gold each year from 1972 to 1982. The abrupt increase in production in 1980 coincides with the increase in the price of gold and the corresponding increase in placer mining activity, while the decrease in production in 1982 coincides with the decrease in the price of gold and the corresponding decrease in placer mining activity.

The production of fine gold from placer deposits each year from 1972 to 1982 is shown in Figure 11. The

difference between the fine gold and crude gold figures is due mainly to the silver contained in the crude gold. The balance is due to other impurities.

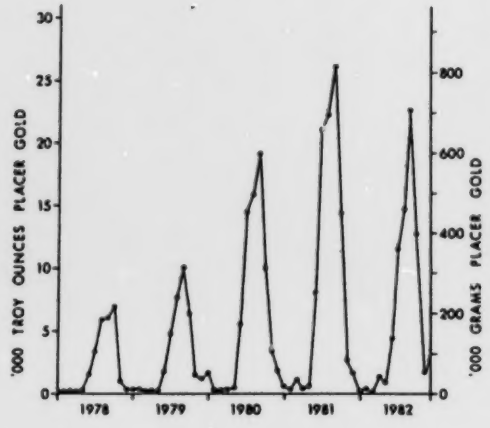


Figure 9: Monthly production rates of crude gold from 1978 to 1982.

The proportion of total Canadian gold production recovered from Yukon placer deposits is illustrated by Figures 12 and 13. Figure 12 shows that total Canadian gold production declined gradually from 1972 to 1981. The sharp increase in total production in 1982 resulted when new lode mines, on which work began while the price of gold was high, finally began producing.

Figure 13 shows that gold production from Yukon placer deposits increased gradually from .19% of total

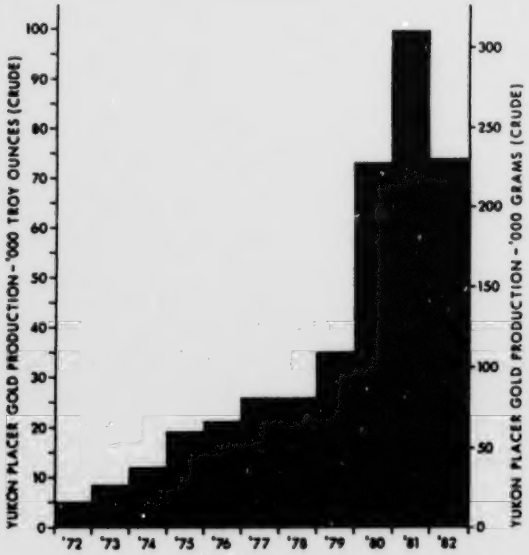


Figure 10: Crude gold producton from placer deposits from 1972 to 1982.

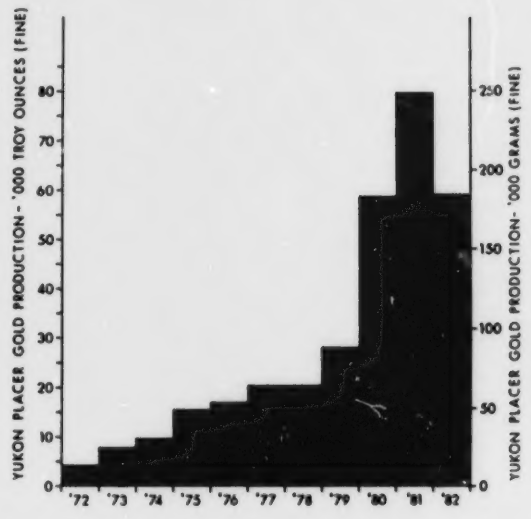


Figure 11: Fine gold production from placer deposits from 1972 to 1982.

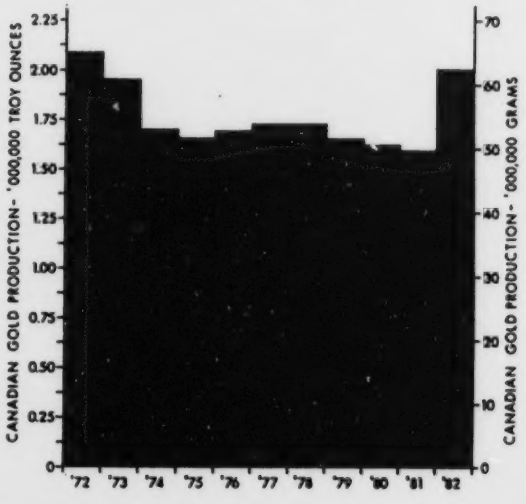


Figure 12: Total Canadian gold production from 1972 to 1982.

Canadian gold production in 1972 to 1.2% in 1978. It jumped to 5.0% in 1981, but declined to 2.9% in 1982.

Royalty records for the period 1978 to 1982 were examined in detail. Summaries of production from individual creeks are listed in Table 8. Production figures in Table 8 are for crude gold. A trend evident in 1981 and 1982 renders the summaries for those years of little use. Producers realized that although obliged by law to pay royalty on gold removed from Yukon, they were not obliged to reveal its source. The percentage of gold from unknown creeks on which royalty was paid rose from 21% in 1978 and 20% in 1979 to 29% in 1980, 64% in 1981, and 80% in 1982.

Table 7: Placer Gold Production from Yukon

Year*	Gold Production+ (fine ounces)	Gold Production+ (grams)	Value (Cdn $)
1885 & 1886 (a)	4,837	150,445	100,000.
1887 (a)	3,386	105,315	70,000.
1888 (a)	1,935	60,184	40,000.
1889 (a)	8,466	263,318	175,000.
1890 (a)	8,466	263,318	175,000.
1891 (a)	1,935	60,184	40,000.
1892 (a)	4,233	131,659	87,500.
1893 (a)	8,514	264,811	176,000.
1894 (a)	6,047	188,080	125,000.
1895 (a)	12,094	376,160	250,000.
1896 (a)	14,513	451,398	300,000.
1897 (a)	120,937	3,761,504	2,500,000.
1898 (a)	483,750	15,046,076	10,000,000.
1899 (a)	774,000	24,073,722	16,000,000.
1900 (a)	1,077,553	33,515,130	22,275,000.
1901 (a)	870,750	27,082,937	18,000,000.
1902 (a)	701,437	21,816,795	14,500,000.
1903 (a)	575,502	17,899,838	10,790,650.
1904 (a)	438,509	13,638,945	8,222,055.
1905	348,800	10,848,726	6,540,010.
1906	176,255	5,482,059	3,304,790.
1907	150,410	4,678,202	2,820,160.
1908	173,882	5,408,252	3,260,280.
1909	191,693	5,962,227	3,594,250.
1910	220,092	6,845,521	4,126,730.
1911	214,626	6,675,512	4,024,235.
1912	267,648	8,324,656	5,018,410.
1913	282,747	8,794,280	5,301,510.
1914	247,981	7,712,953	4,649,635.
1915	237,775	7,395,516	4,458,280.
1916	211,211	6,569,296	3,960,205.
1917	174,180	5,417,521	3,265,875.
1918	85,304	2,653,210	1,599,440.
1919	88,403	2,749,599	1,657,570.
1920	66,049	2,054,322	1,238,420.
1921	65,653	2,042,005	1,230,985.
1922	55,602	1,729,389	1,042,535.
1923	60,551	1,883,318	1,135,335.
1924	33,358	1,037,534	625,560.
1925	45,950	1,429,183	861,570.
1926	26,534	825,287	497,505.
1927	30,305	942,576	568,220.
1928	34,916	1,085,992	654,670.
1929	35,069	1,090,751	657,535.
1930 (a)	35,320	1,098,558	730,065.
1931 (a)	44,310	1,378,174	915,890.
1932 (a)	40,780	1,268,380	1,010,935.
1933 (a)	39,170	1,218,305	1,120,260.
1934 (a)	38,700	1,203,686	1,335,150.
1935	35,651	1,108,853	1,247,785.
1936	50,109	1,558,540	1,753,815.
1937	46,832	1,456,616	1,639,120.
1938	72,476	2,254,221	2,536,660.
1939	86,462	2,689,228	3,026,170.
1940	78,511	2,441,928	2,747,885.
1941	69,954	2,175,779	2,448,390.
1942	84,345	2,623,383	2,952,075.
1943	42,283	1,315,128	1,479,905.
1944	23,529	731,822	823,515.
1945	32,040	996,540	1,121,400.
1946	45,730	1,422,340	1,600,550.
1947	47,589	1,480,161	1,665,615.
1948	60,906	1,894,359	2,131,710.
1949	83,886	2,609,106	2,936,010.
1950	94,036	2,924,802	3,291,260.
1951	62,405	1,940,983	2,184,175.
1952 (a)	78,520	2,442,208	2,748,200.
1953 (a)	66,080	2,055,286	2,312,800.
1954 (a)	82,210	2,556,978	2,877,350.
1955	73,116	2,274,127	2,559,060.
1956	70,733	2,200,008	2,475,655.
1957	74,266	2,309,895	2,599,310.
1958	67,168	2,089,126	2,350,880.
1959	68,042	2,116,310	2,381,470.
1960	74,454	2,315,743	2,605,890.
1961	64,747	2,013,826	2,266,145.
1962	53,854	1,675,021	1,884,890.
1963	56,062	1,743,696	1,962,170.
1964	56,330	1,752,032	1,971,550.
1965	45,030	1,400,568	1,576,050.
1966	43,337	1,347,911	1,516,795.
1967	9,402	292,430	329,070.
1968	7,570	235,450	264,950.
1969	8,508	264,624	297,780.
1970	6,762	210,318	236,670.
1971	4,394	136,667	157,790.
1972	4,234	131,690	243,455.
1973	6,807	211,718	663,000.
1974	9,708	301,948	1,614,925.
1975	15,502	482,159	2,509,465.
1976	17,050	530,306	2,139,775.
1977	20,554	639,291	3,387,915.
1978	20,630	641,655	4,702,815.
1979	28,080	873,372	10,992,480.
1980	58,526	1,820,334	42,138,720.
1981	79,733	2,479,935	42,657,155.
1982	59,234	1,842,355	27,247,640.
TOTAL:	**11,187,525**	**347,965,585**	**384,290,088.**

* Production figures for 1885 to 1959 are for fiscal years, which are from April 1 of the year in question to March 31 of the following year. Production figures for 1960 to 1982 are for calendar years.

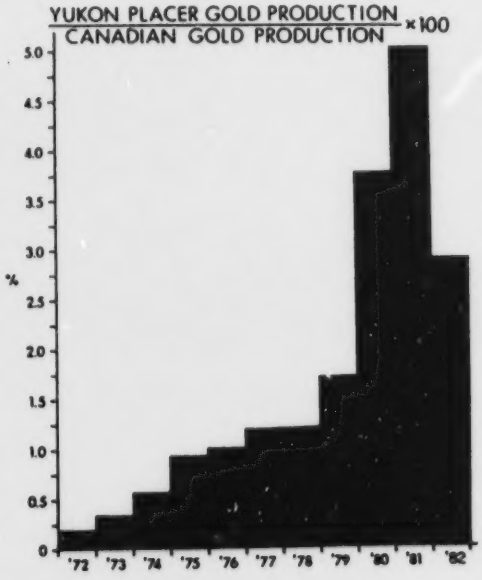
\+ Gold production is listed in both fine ounces (Troy), and grams. Production figures for 1885 to 1902 are based primarily on receipts of gold at United States mints and receiving offices credited to the Yukon Territory. Although a royalty was extracted on the gold beginning in 1897, considerable amounts of gold were produced which escaped royalty payment especially during the years of high production. Between 1897 and 1902, royalty was paid in Yukon on approximately half the amount of gold credited to the territory at United States mints and receiving offices. Production figures for 1903 to 1982 are based on royalty records. The assumed gold fineness used in calculating fine gold content of crude gold on which royalty was paid is 800.

(a) Product figure is approximate.

Table 8: Placer Gold Production From Yukon Creeks, 1978 to 1982

CREEK	1978 oz. dwt. (tonnes)	1979 oz. dwt. (tonnes)	1980 oz. dwt. (tonnes)	1981 oz. dwt. (tonnes)	1982 oz. dwt. (tonnes)
Adams Creek	7 07 (229)	8 13 (269)	184 00 (5723)	93 14 (2916)	233 11 (7266)
Alt Gold Creek	106 03 (3683)	218 06 (6790)	59 17 (1862)	16 00 (570)	7 07 (229)
Anderson Creek	-- --	-- --	11 16 (367)	-- --	-- --
Arch Creek	-- --	-- --	2 16 (87)	-- --	-- --
Barker Creek	-- --	-- --	26 11 (766)	80 15 (2512)	162 00 (5039)
Bear Creek (Klondike area)	761 02 (23672)	166 07 (4552)	2830 03 (88026)	376 01 (11636)	22 00 (684)
Bear Creek (Mayo area)	-- --	-- --	-- --	130 03 (4048)	6 10 (140)
Bedrock Creek	27 11 (857)	16 06 (465)	99 19 (3109)	-- --	-- --
Big Creek (tributary)	20 12 (661)	-- --	-- --	-- --	-- --
Big Gold Creek	-- --	-- --	36 00 (1050)	-- --	-- --
Big Salmon River	-- --	10 00 (311)	-- --	-- --	-- --
Black Hills Creek	2236 01	896 03	2226 06	66 01	-- --
Black Hills, Henderson, and Eureka Creeks	(69466) -- --	(27873) 2585 16 (80426)	(69265) 2866 03 (89146)	(2054) -- --	-- --
Bonanza Creek - lower	660 11	667 19	1290 03	862 18	2323 10
- upper	(16573) 103 01 (3205)	(20775) 960 05 (29867)	(40128) 1563 04 (48629)	(26839) 270 12 (8465)	(72268) 272 05 (8448)
Burnush Creek	-- --	130 16 (4070)	189 07 (5889)	767 17 (23268)	10 04 (564)
Canadian Creek	10 02 (316)	0 17 (26)	-- --	106 18 (3263)	121 16 (3788)
Caribou Creek	33 10 (1062)	227 12 (7079)	693 19 (21584)	30 16 (955)	296 00 (9207)
Carlson Creek	-- --	-- --	68 12 (1512)	-- --	-- --
Clear Creek	384 11 (11961)	620 07 (19295)	930 09 (29189)	1986 18 (61736)	2267 06 (69980)
Cottonwood Creek	-- --	-- --	8 15 (273)	-- --	-- --
Davidson Creek	-- --	128 05 (3989)	2 01 (64)	-- --	-- --
Dawn Creek	-- --	4 00 (126)	-- --	11 15 (365)	-- --
Discovery Creek	-- --	-- --	30 00 (630)	-- --	-- --
Dollis Faquard Creek	-- --	298 14 (8866)	225 02 (7001)	279 12 (7652)	95 06 (2905)
Donjek River	-- --	-- --	23 12 (736)	-- --	-- --
Dominion Creek	177 02 (5508)	551 17 (17164)	3884 07 (89712)	3609 00 (112363)	761 07 (23680)
Dublin Gulch	776 19 (24165)	463 00 (14401)	410 00 (12752)	300 00 (9331)	-- --
Duncan Creek	596 11 (18692)	430 11 (13391)	506 15 (15761)	116 19 (3575)	721 07 (22991)
Eldorado Creek	737 07 (22936)	1062 02 (32612)	1783 01 (55468)	653 15 (20336)	631 16 (19651)
Eureka Creek	500 14 (15928)	1609 06 (48838)	2612 19 (81271)	1965 00 (61578)	3080 10 (95813)
Excelsior Creek	6 13 (165)	-- --	3 10 (109)	-- --	-- --
Flat Creek	-- --	-- --	10 10 (327)	-- --	-- --
Firth River	-- --	58 16 (1826)	190 00 (5910)	79 16 (2479)	-- --
Fourth of July Creek	-- --	-- --	-- --	1827 01 (56862)	7 12 (236)
Glacier Creek	319 01 (9813)	411 02 (12786)	351 04 (9813)	496 06 (14981)	-- --
Gold Bottom Creek	378 10 (11788)	26 02 (760)	1367 11 (42535)	633 01 (13469)	126 00 (3919)
Gold Run Creek	-- --	-- --	21 10 (669)	-- --	-- --
Haggart Creek	16 09 (469)	116 09 (3560)	-- --	6 00 (186)	170 15 (5311)
Hanna Creek	8 01 (250)	-- --	-- --	-- --	-- --
Henderson Creek	2871 15 (89382)	665 00 (19463)	2309 05 (71825)	88 13 (2757)	31 17 (991)
Highet Creek	163 13 (4988)	245 09 (7636)	162 12 (4435)	117 06 (3665)	69 00 (1534)
Hoke Creek	10 10 (317)	7 06 (227)	-- --	-- --	-- --

CREEK	1978 oz. dwt. (tonnes)	1979 oz. dwt. (tonnes)	1980 oz. dwt. (tonnes)	1981 oz. dwt. (tonnes)	1982 oz. dwt. (tonnes)
Hope Creek	-- --	8 05 (257)	-- --	-- --	-- --
Hunker Creek	1346 07 (38765)	2163 19 (67305)	2392 13 (74619)	1612 16 (50163)	283 02 (8776)
Johnson Creek	-- --	205 02 (6379)	231 11 (7202)	657 00 (15167)	-- --
Josephine Creek	-- --	-- --	16 12 (516)	12 12 (392)	-- --
Kimberly Creek	-- --	-- --	-- --	5 00 (156)	68 04 (2134)
Lake Creek	-- --	1 17 (50)	-- --	-- --	-- --
Last Chance Creek	75 00 (2333)	17 15 (552)	137 05 (4269)	-- --	-- --
Lodge Creek	-- --	6 05 (132)	-- --	-- --	-- --
Lord River	-- --	-- --	-- --	2 02 (96)	-- --
Lightning Creek	169 15 (4658)	-- --	6 08 (137)	-- --	-- --
Little Gold Creek	-- --	-- --	723 10 (22515)	756 02 (24655)	-- --
Livingstone Creek Area	6 00 (126)	68 03 (1498)	111 10 (3600)	77 16 (2555)	76 06 (2373)
Mayo May Creek	-- --	-- --	538 09 (16767)	301 16 (9384)	55 14 (1732)
Merten Creek	315 01 (9799)	1765 08 (56287)	2616 03 (75150)	650 16 (16267)	32 00 (1008)
McQuesten River	-- --	-- --	8 10 (266)	13 07 (415)	-- --
Miller Creek	66 05 (1998)	-- --	1188 08 (36963)	91 06 (2837)	599 01 (18632)
Minnie Creek	62 02 (1309)	-- --	198 02 (5913)	208 17 (6496)	-- --
Mosier Creek	-- --	256 16 (7922)	22 17 (711)	-- --	-- --
Mossehorn Range Creeks	4526 18 (140800)	2308 18 (68455)	1233 06 (38359)	2011 00 (62548)	-- --
Nansen Creek	-- --	-- --	7 19 (247)	53 05 (1656)	-- --
Ora Grande Creek	-- --	-- --	4 19 (154)	-- --	-- --
Quartz Creek	1194 15 (37162)	358 05 (11193)	2780 00 (86446)	1909 15 (59399)	100 06 (3117)
Revenue Creek	221 17 (6892)	321 00 (9984)	260 09 (8101)	688 16 (21466)	508 00 (15552)
Rude Creek	-- --	-- --	618 06 (19228)	106 09 (3298)	-- --
Scroggie Creek	-- --	-- --	32 13 (1016)	-- --	-- --
Seattle Creek	-- --	-- --	-- --	197 15 (6151)	-- --
Sheep Creek	-- --	-- --	7 13 (238)	-- --	-- --
Sixty Mile River	1130 18 (35174)	2870 10 (89339)	3213 05 (99962)	1691 05 (52603)	369 12 (11496)
Sunsara Gulch	26 10 (762)	6 07 (195)	1 02 (36)	-- --	-- --
Squaw Creek	-- --	-- --	-- --	-- --	10 00 (311)
Upper Creek and Squirrel Creek	-- --	8 00 (249)	90 18 (2827)	131 16 (4096)	40 08 (1257)
Sheep Creek	-- --	13 10 (420)	-- --	-- --	-- --
Stewart River	19 00 (591)	22 08 (697)	17 16 (556)	6 15 (168)	-- --
Stoddart Creek	-- --	-- --	-- --	39 19 (1293)	-- --
Sulphur Creek	-- --	36 00 (1130)	6903 10 (216732)	7153 00 (222680)	1119 09 (34818)
Ten Mile Creek	838 06 (25763)	550 16 (17132)	-- --	1190 05 (37020)	626 07 (13261)
Thistle Creek	-- --	-- --	1401 08 (43588)	2375 16 (73895)	36 00 (1088)
Thunder Gulch	-- --	-- --	9 19 (299)	-- --	-- --
Too Much Gold Creek	-- --	-- --	-- --	15 00 (467)	-- --
Vanzon Creeks	5662 00 (167883)	12963 19 (403218)	22761 12 (707332)	61600 05 (1978159)	58897 07 (1831853)
Wheaton River	-- --	-- --	13 14 (429)	-- --	-- --
Total Ounces	25788 03 (802089)	35100 01 (1091717)	73158 02 (2275436)	99666 08 (3099912)	76862 05 (2302936)



Records of Delta Smelting and Refining Co. Ltd. were used to prepare Table 9. In it, production figures of crude gold for the years 1978 to 1982 were summarized by creek. The percentage of gold from unknown creeks is 18.6% in Table 9.

Table 10 lists the twelve most productive creeks, and the amounts of crude gold recovered from them during the years 1978 to 1982.

Figure 13: Gold production from Yukon placer deposits as a percentage of total Canadian gold production from 1972 to 1982.

Table 9: Summary of Placer Gold Production, 1978 to 1982

Creek	Ounces	Grams
Adams Creek	526	16,360
All Gold Creek	1,010	31,414
Anderson Creek	18	560
Arch Creek	3	93
Ballarat Creek	1,054	35,783
Barker Creek	267	8,305
Bear Creek (Klondike area)	10,060	312,896
Bear Creek (Mayo area)	134	4,168
Bedrock Creek	276	8,584
Big Creek tributary	84	2,613
Big Gold Creek	711	22,114
Big Salmon River	33	1,026
Black Hills Creek	10,244	318,619
Bonanza Creek	18,491	575,126
Burwash Creek	1,221	37,977
Canadian Creek	686	21,337
Caribou Creek	2,213	68,831
Carlson Creek	67	2,084
Clear Creek	7,063	219,680
Cottoneva Creek	9	280
Davidson Creek	258	8,025
Dawn Creek	15	467
Discovery Creek	20	622
Donjek River	24	746
Dominion Creek	19,915	619,416
Dublin Gulch	1,650	51,320
Duncan Creek	2,755	85,689
Eldorado Creek	9,616	299,086
Eureka Creek	23,180	720,968
Excelsior Creek	8	249
Flat Creek	10	311
Firth River	337	10,482
Fortymile River	191	5,941
Fourth of July Creek	3,601	112,002
Glacier Creek	1,419	44,135
Gold Bottom Creek	4,086	127,087
Gold Run Creek	147	4,572
Haggart Creek	356	11,073
Hayes Creek	86	2,675
Henderson Creek	9,830	305,742
Highet Creek	2,509	78,037
Hobo Creek	18	560
Hope Creek	8	249
Hunker Creek	14,528	451,864
Johnson Creek	1,604	49,889
Josephine Creek	29	902
Kimberley Creek	367	11,415
Klondike River	556	17,293
Lake Creek	2	62
Last Chance Creek	1,889	58,754
Ledge Creek	10	311
Liard River	3	93
Lightening Creek	154	4,790
Little Gold Creek	1,990	61,895
Little South Klondike River	47	1,462
Livingstone Creek	414	12,877
Maisy May Creek	2,998	93,247
Martin Creek	34	1,058
Matson Creek	6,178	192,154
McQuesten River	26	809
Miller Creek	8,654	269,165
Minto Creek	447	13,903
Moose Creek	440	13,685
Moosehorn Range Creeks	13,340	414,914
Nansen Creek	62	1,928
Oro Grande Creek	13	404
Porcupine Creek	3	93
Quartz Creek	10,932	340,018
Revenue Creek	2,489	77,415
Rude Creek	722	22,456
Scroggie Creek	1,624	50,511
Seattle Creek	198	6,158
Sestak Creek	2	62
Sixty Mile River	16,901	525,672
Squaw Creek (Clear Creek area)	10	311
Squirrel Creek	484	15,054
Steep Creek	14	435
Stewart River	63	1,959
Sulphur Creek	20,291	631,111
Summit Creek	80	2,488
Ten Mile Creek	5,922	184,192
Thistle Creek	2,636	81,988
Thunder Gulch	10	311
Various Creeks	57,366	1,784,255
Wheaton River	14	435
TOTAL:	307,755	9,572,104

Table 10: The Most Productive Creeks, 1978 to 1982

Status	Creek	Ounces	Grams
1	Eureka Creek	23,180	720,968
2	Sulphur Creek	20,291	631,111
3	Dominion Creek	19,915	619,416
4	Bonanza Creek	18,491	575,126
5	Sixty Mile River	16,901	525,672
6	Hunker Creek	14,528	451,864
7	Moosehorn Range Creeks	13,340	414,914
8	Quartz Creek	10,932	340,018
9	Black Hills Creek	10,244	318,619
10	Bear Creek (Klondike area)	10,660	312,896
11	Henderson Creek	4,830	305,742
12	Eldorado Creek	9,616	299,086

LEGISLATION AND REGULATIONS GOVERNING PLACER MINING

Legislation and regulations governing placer mining differ in different jurisdictions. Excerpts from relevant legislation are listed below. Addresses where additional information may be obtained are also listed. Anyone planning staking or mining activities is advised to contact the appropriate agency for complete information prior to beginning work.

Jurisdiction: Federal

Staking Regulations: Placer dispositions in Yukon are of two types known as claims and leases. Either may be staked by any person 18 years of age or older. There are no license or residency requirements.

Placer claims and leases may be staked almost anywhere within the territory. Excluded areas include parks and park reserves, and areas within communities.

Placer claims and leases must be staked along a "base line" which marks the center line of the valley, and of the claim. The stream itself may be some distance from the base line in wide valleys. The base line may or may not have been surveyed. Survey makers may have been destroyed by subsequent mining operations. Resurveys have been done in recent years on many of the creeks on which there has been placer activity. The list at the end of this section indicates the creeks on which base line surveys have been done, and when they were carried out. Survey plans are on file at the office of Surveys and Mapping Branch, Department of Energy Mines and Resources in Whitehorse. Microfilms of the field books are on file at the Department of Energy Mines and Resources in Ottawa.

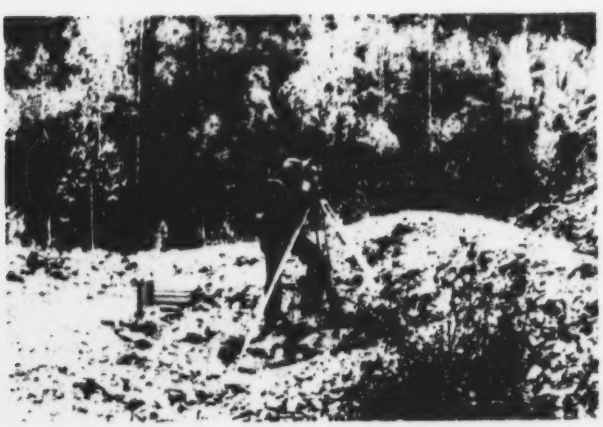


Figure 2: A resurvey of the Bonanza Creek base line was done in 1979.

Placer claims are up to 500 feet long, and are 2,000 feet wide. Claim boundaries are perpendicular to the base line. Wedge shaped claims may result where bends in the base line occur. Larger "discovery" claims are allowed when the claim is the first one staked on a creek. The location line is marked by initial and final posts inscribed with specified information, and must be blazed and otherwise well marked along its length. Placer tags are issued when the claim is granted, and must be affixed to the claim posts within a reasonable time after their issue.

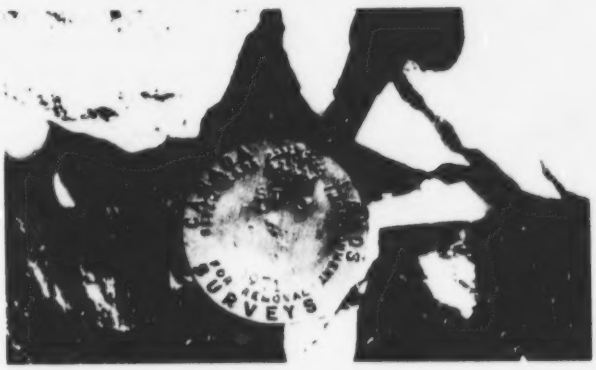


Figure 3: Survey markers are brass pins with inscribed heads approximately 6.5 cm (2.5 inches) in diameter. They are usually set in small rock cairns, and marked by coloured flagging.

Figure 4: Claim posts must not be moved or defaced, even where the claims they mark out are no longer in good standing.

Stakers have 10 days in which to record their claim if the claim lies within 10 miles of the Mining Recorder's office. One additional day is added to the recording time for each additional 10 miles or fraction thereof the claim is from the Mining Recorder's office. One claim per watershed may be staked every 60 days by a staker.

Assessment work totalling $200.00 per year for each placer claim must be carried out. A Schedule of Representation Work lists allowable costs for various types of work.

Yukon Placer Mining, 1978-82, p. 15-17

Placer leases endow exclusive prospecting rights to the holder but not the right to mine. On creeks which have no record of placer activity, a lease may be up to one mile long, and 2,000 feet wide. On creeks which have a record of placer activity, a lease may be up to five miles long, and 2,000 feet wide.

Lease boundaries are also perpendicular to the base line. The location line is again marked by initial and final posts inscribed with specified information, and must be blazed and otherwise well marked along its length.

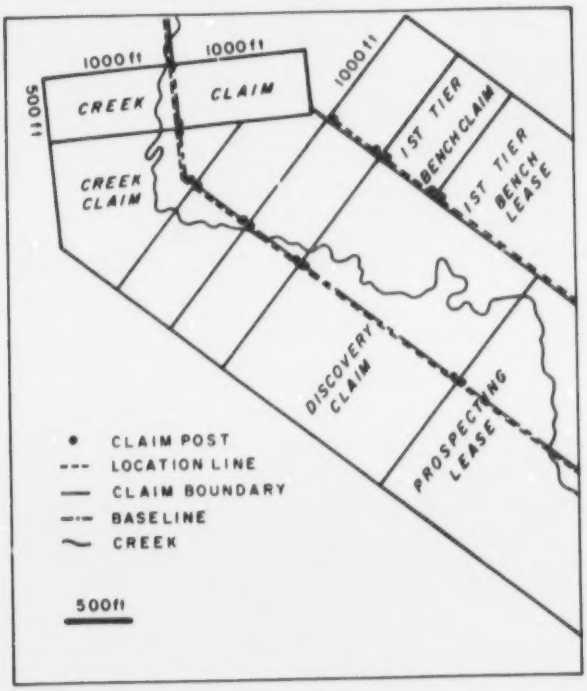


Figure 5: Example of typical placer claims and leases in Yukon.

Stakers again have 10 days in which to record their lease if the lease lies within 10 miles of the Mining Recorder's office. One additional day is added to the recording time for each additional 10 miles or fraction thereof the lease is from the Mining Recorder's office.

Every lease which is staked is not necessarily issued. Leases are issued at the discretion of the Commissioner of the territory. One prerequisite for the granting of a placer lease is the financial ability of the lessee to fund a prospecting program on the lease.

Assessment work totalling $1,000.00 per mile, per year for each placer lease must be carried out. A Schedule of Representation Work lists allowable costs for various types of work. Leases on creeks which have no record of placer activity are in effect for one year. After completion of his assessment work, the lessee may stake one discovery claim on his lease. The remainder of the lease then lapses. Leases on creeks which have a record of placer activity may last for three years. After completion of his assessment work in any year, the lessee may stake any or all of his lease into claims.

Any individual may have only one lease at a time. Assignments of leases may be made to other holders, but not without the prior permission of the Commissioner.

Stakers wishing to stake claims or leases more than 1,000 feet from a base line may stake "bench" claims or leases. Such dispositions are 1,000 feet wide rather than 2,000 feet. They may be staked in "tiers" away from the base line, or single claims or leases may be staked any multiple of 1,000 feet from the base line. All regulations which apply to creek disposition also apply to bench dispositions.

Regulations Governing Mining: Regulations of the federal Departments of Indian Affairs and Northern Development, and Fisheries and Oceans apply to placer mines in Yukon. Regulations of the territorial Departments of Consumer and Corporate Affairs, and Health may also apply.

A Land Use permit must be obtained from Department of Indian Affairs and Northern Development (D.I.A.N.D.) Lands Branch before heavy equipment may be moved across crown land to placer claims or leases. Land Use permits are not required for activities carried out once on the claims and leases.

Water use is regulated by the Yukon Territory Water Board through the Water Resources Branch, D.I.A.N.D. No water may be used without a Water Use authorization. A Water Use license may be required in rare cases if use of extremely large amounts of water over a long time period is planned. Water Use authorizations list the amount of water which may be taken from specified sources, and indicate restrictions on mining, equipment use, tailings disposal and waste water treatment. They are not issued to companies or corporations unless they are registered for business in Yukon with the Yukon Department of Consumer and Corporate Affairs. They are also not issued unless the applicant holds valid claims or leases where the water is to be used.

The federal Department of Fisheries and Oceans does not issue authorizations or licenses to placer mining operations in Yukon. It does, however, inspect operations under the authority of the federal Fisheries Act to ensure that waste-water quality is not deleterious to fish populations.

Several federal agencies have been working with representatives of the placer mining industry in an attempt to establish criteria for water use in placer mining, and waste-water quality standards. When such criteria and standards come into effect, the conditions governing mining listed here may change.

The Environmental Health officer of the territorial

Department of Health may require a camp operation application to cover disposal of camp wastes.

Further information may be obtained from:

Supervising Mining Recorder

or from:

Comptroller of Water Rights

both of:

D.I.A.N.D.
200 Range Road
Whitehorse, Yukon
Y1A 3V1

PLACER DEPOSITS: THEIR FORMATION, EVALUATION, AND EXPLOITATION

by
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Introduction

Placer deposits are defined as being "gravel, sand, or other similar material resulting from the crumbling and erosion of solid rocks containing particles or nuggets of gold, platinum, tin, or other valuable minerals, that have been derived from rocks or veins" (American Geological Institute, 1957). Placer deposits are known worldwide. They occur in deposits of all ages. This paper is concerned particularly with the unconsolidated placer gold deposits found in the northern Canadian Cordillera.

Formation of Placer Deposits

The formation of placer deposits has several prerequisites. They include a source for the gold, a mechanism to concentrate it, and time for the concentrating mechanism to work.

The source of the gold could be gold-quartz veins, gold bearing sulphide deposits, or previously formed placer deposits. In Yukon and the Atlin Mining Division of British Columbia, there are no known lode gold deposits associated with placer deposits which are large enough to have supplied all the gold in the placer deposits. There are however, numerous small lode gold occurrences in close proximity to some of the placer deposits. There are also spatial associations between placer deposits and certain types of bedrock, including the Klondike Schist, foliated rocks of the Yukon Group, granitic rocks of the 100 million year suite, and ultramafic rocks. Concentration of even the very small amounts of gold from unmineralized bedrock will provide large amounts of gold if the amount of bedrock involved is large enough. Evans (1981) suggests that such concentration may occur chemically. Girling et al (1979) and Antweiler (1982) suggest that it may occur biogenically.

Concentration of gold in placer deposits occurs through erosion. Gold is chemically resistant compared to most minerals, so does not decompose through weathering as do most other minerals. Placer gold concentrations may occur in residual eluvial and deluvial deposits overlying and close to a lode gold source, as indicated in Figure 1. Such deposits are present in the Moosehorn Range of Yukon.

Most placer deposits have, however, been further concentrated through the action of moving water in streams or on beaches. The current causes some material to be carried in suspension in water, and other material to roll or bounce along the bed of the stream or beach. Because gold is much heavier than other minerals, it is not carried away by the current when other minerals are. Hence, it becomes concentrated in the deposits remaining on the bed of the stream or the beach.

Typical sites for accumulation of placer gold deposits occur where the rate of flow decreases. Such sites include the inside of meander curves, at decreases in stream gradients, at the confluence of creeks, and where physical obstructions such as irregularities in the bedrock surface, or the surface of the sand and gravel present occur. Figures 2 to 13 illustrate such sites in streams. On beaches, such sites include the upstream side of ripples, and dunes oriented across the direction of current flow.

The characteristics of the particular environment of deposition impart characteristics to the deposits in which the gold is concentrated. In deposits of meandering streams, for instance, gold occurs in distinct pay-streaks at the base of the deposits. In deposits of braided streams, however, the gold occurs erratically throughout the deposits. The characteristics of the particular environment of deposition also impart characteristics to the grain size distributions of gold in the deposits. High-energy streams can transport coarser particles of gold than can low-energy streams. Any stream can transport fine particles farther than it can transport coarse particles. McConnell (1907) reported that coarse gold liberated from White Channel deposits where they were cut by gulches was deposited immediately below the place from which it was eroded. In some cases, the horizontal movement of

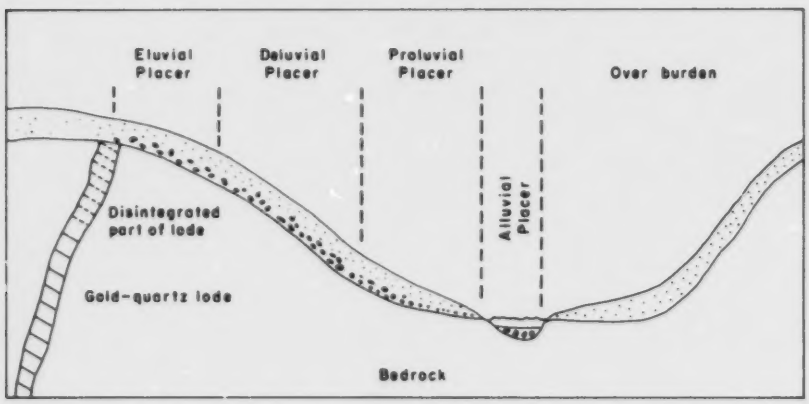

Figure 1:

Cross-section of a gold-quartz vein supplying material to form eluvial and alluvial placer deposits (after Boyle, 1979).

Yukon Placer Mining, 1978-82, p. 18-34

Figure 2: View of meanders along the Stewart River east of Mayo.

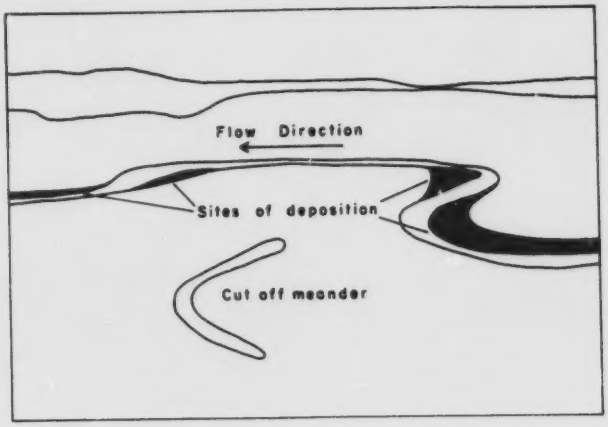

Figure 3: Sites of gold deposition along the inside of meander curves. Gold is also deposited on the ends of sand and gravel bars in braided streams.

Figure 4: View of delta at the mouth of Cascade Creek on Mayo Lake.

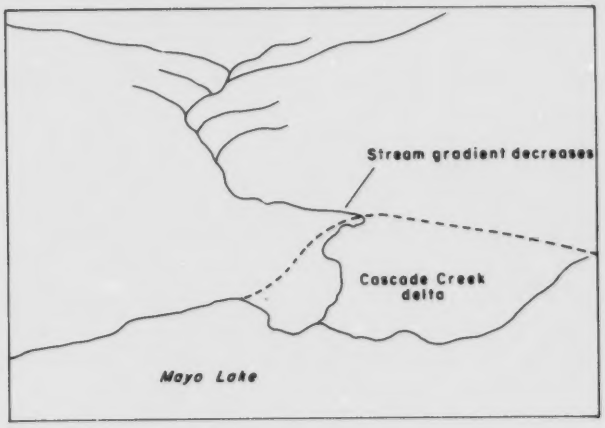

Figure 5: Site of gold deposition at the apex of the Cascade Creek delta, where the stream gradient decreases.

Figure 6: View of D. Coombs' mining operation along upper Bonanza Creek.

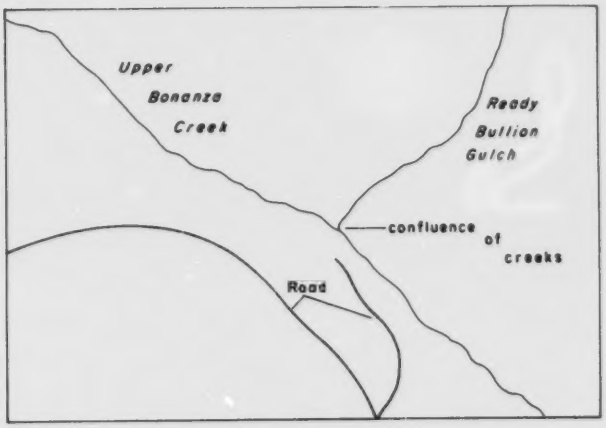

Figure 7: Site of gold deposition downstream from the confluence of Ready Bullion Gulch and upper Bonanza Creek.

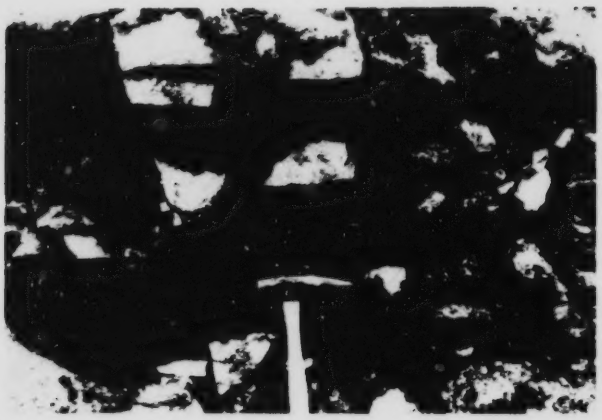

Figure 8: Plan view of irregularities in the bedrock surface beneath mined-out stream deposits.

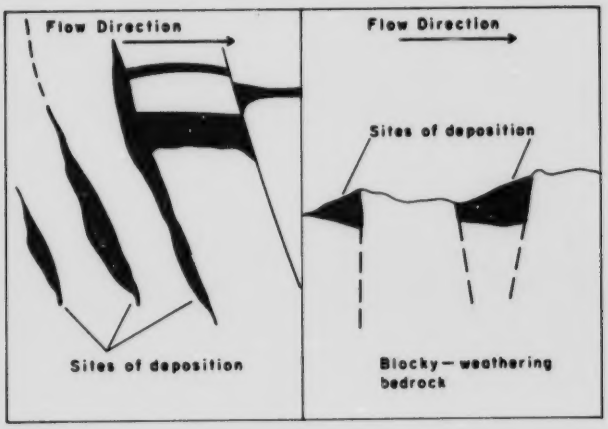

Figure 9: Sites of gold deposition behind obstructions in the bedrock surface. A plan view is at left, and a cross-section is at right.

Figure 10: View of imbricated clasts in a shallow stream.

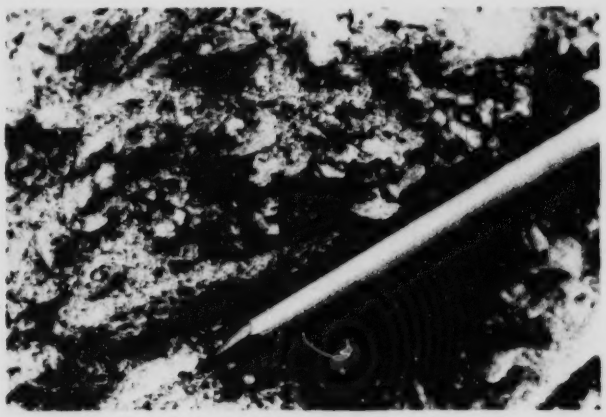

Figure 11: Site of gold deposition behind an imbricated pebble in stream deposits. The black grains resting on the pebble above the pencil are magnetite, which is a heavy mineral often found with gold.

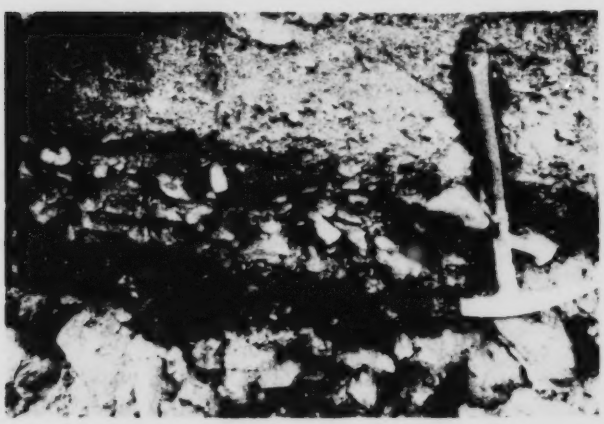

Figure 12: View of gravel section with black manganese stain where little matrix is present between the pebbles.

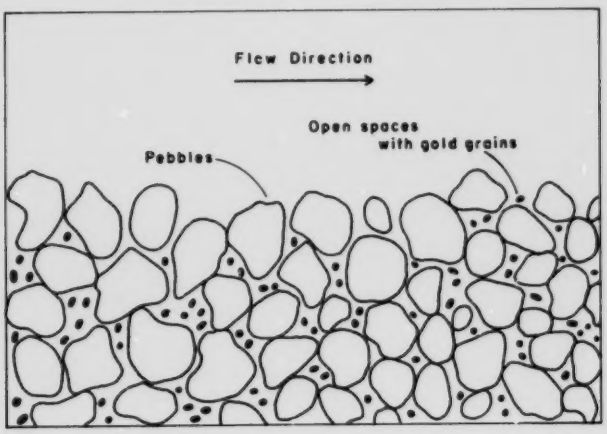

Figure 13: Cross-section of gravel deposits with little matrix. The open spaces between clasts are sites of gold deposition.

the grains scarcely equalled their vertical movement. Gorbunov (1959) examined placer deposits in streams in Siberia in similar environments to those in Yukon, and found that where more than 50% of the gold grains were coarser than 2 mm (.08 inches or 9 mesh), the gold was most often transported 500 metres (1,640 feet) from known lode sources. He also found that where less than 35% of the gold grains were coarser than 2 mm (.08 inches or 9 mesh), the gold was most often transported 1,500 to 2,000 metres (4,920 to 6,560 feet) from known lode sources. Very fine grains of gold may be transported long distances by streams.

The processes of erosion responsible for the concentration of gold in placer deposits have been active in the Canadian Cordillera for the past 100 million years. From 100 to 65 million years ago, southern and central Yukon underwent a long period of erosion under a warm temperate climate, and an upland surface of low relief was formed. Deep physical and chemical weathering of the bedrock occurred. Evidence of the physical weathering is preserved near Whitehorse and near Dawson, where a layer of disintegrated bedrock is preserved beneath younger deposits. Evidence of the chemical weathering is preserved at Keno Hill where alteration of the bedrock is present up to 120 metres (400 feet) below surface, and at the Casino property in the Dawson Range where alteration of the bedrock is present up to 230 metres (750 feet) below surface.

By 65 million years ago, deep interlocking drainage systems dissected the erosional surface of low relief leaving the topography similar to that of today. The erosional surface is marked at present by the accordant summits of the Yukon Plateau, including those in Figure 14.

Figure 14: View south across the Top-of-the-World Highway west of Dawson City, showing the accordant summits marking the 65 million year old erosional surface.

Deposits of streams between 65 and 55 million years ago form the conglomerates in the Indian River and Sixty Mile River areas. These deposits are described in more detail by Lowey (1982). They are intercalated with, and overlain by volcanic rocks. Similar deposits in California have been worked by hydraulic and underground mining methods for their placer concentrations of gold. In Yukon, these gravels have been tested by drilling and by shaft sinking, but no economic concentrations of gold have been found. The areas tested are, however, those in which very thick accumulations of conglomerate were deposited in restricted fault-bounded troughs. Other accumulations of gravel of this age preserved in stream channels of the time may have better potential for hosting placer deposits.

Lateral and vertical movement on the Tintina and ancillary faults between 23 and 2 million years ago caused local adjustments of stream profiles and configurations. The well-known White Channel gravels of the Klondike area were deposited near the end of this time interval during a period of warm, temperate climatic conditions. The gravel was deposited as a thick blanket in a broad, flat-bottomed valley or strath, as shown in Figure 15. The depositional history of the White Channel deposits is described in detail by Milner (1972). The gold concentrations in the deposits are described in detail by McConnell (1901).

Climatic conditions cooled near the end of the period of deposition of the White Channel gravel. The first of a series of four glacial advances occurred more than 50,000 years ago. Ice up to 1,500 metres (4,925 feet) thick covered much of southern and central Yukon. The ice flowed westward out of the Selwyn Mountains, northward out of the Cassiar and Coast Mountains, and northeastward out of the St. Elias Mountains. Only the Klondike Plateau, and a few mountainous plateaux that stood above the ice sheet near its margin escaped glaciation. Parts of the McArthur and Gustavus Ranges were high enough to stand above the ice sheet, but they were also high enough to support cirque glaciers which merged with the ice sheet. The extent of the ice sheets is shown in Figure 16.

A striking feature of the glaciated regions is the abundance of lakes, which are virtually absent in the unglaciated regions. Particularly striking are large elongate lakes lying in deep trough-like valleys which were carved into mountainous plateaux by glacial erosion. Although the erosion was undoubtedly concentrated along depressions in the pre-glacial surface, in places the troughs represent hundreds of metres of glacial scouring.

Figure 14 shows unglaciated terrain in the Klondike Plateau. It is characterized by deeply incised V-shaped valleys separated by rounded ridges with accordant summits. This topography must have been characteristic of all but the most mountainous regions of southern and central Yukon prior to glaciation. Remnants of pre-glacial valley-and-ridge topography remain in glaciated terrain, as shown in Figure 17. However, broad, U-shaped valleys with continuous, smooth valley sides characterize glaciated areas such as the one in Figure 18.

There is little chance that placer deposits survived the intense scouring which occurred in deeply eroded glacial valleys. Gold in placer deposits present prior to glaciation was dispersed through such large volumes of glacial till and glaciofluvial gravel that the deposits are no longer economic. Post-glacial streams have reconcentrated gold distributed in some such deposits. The Stewart River, for example, is incised 30 to 55 metres (100 to 180 feet) into glacial deposits from above Mayo to below McQuesten River. Gold from the glacial deposits was reconcentrated in the river bars. Other placer gold concentrations have been formed by the reworking of glacial deposits of the upper reaches of several creeks in the Atlin area, including Spruce Creek as shown in Figure

Figure 15:

View of White Channel deposits along the right limit of Bonanza Creek near its mouth. The gravel blankets the strath terrace. Tailings from hydraulic mining operations along the terraces are in the centre of the photograph.

Figure 16: The extent of ice sheets during glaciation. Unshaded areas were not glaciated. Numbers on the areas with light shading indicate the number of thousands of years ago when the ice sheet melted away from the area. Dark shading indicates alpine glaciers which are still present.

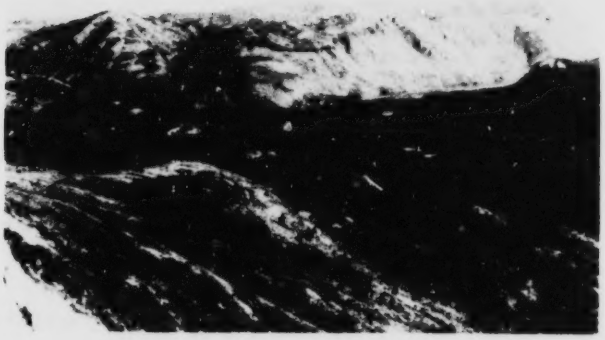

Figure 17: The ridge in the distance of the photograph comprises a remnant of pre-glacial valley-and-ridge topography in the glaciated terrain at Long Lake, 48 km (30 miles) north of Whitehorse.

Figure 18: View of broad, U-shaped valleys in glaciated terrain at McDonald Lake, 18 km (11 miles) north of Atlin.

19.

Small valleys oriented at right angles to the direction of glacial flow were protected from deep scouring, and placer gold concentrations in them may have survived. Westward flowing creeks which flow into the South Big Salmon River upstream and downstream of Livingstone Creek have placer deposits which survived glaciation in their middle reaches. The same creeks are barren in their lower reaches, which lie in the deeply eroded South Big Salmon River valley. Several creeks tributary to Mayo Lake have placer deposits which were protected in the same way.

Placer deposits which have been preserved in glaciated regions are difficult to find unless they have been cut by post-glacial streams. Where this has occurred, gold winnowed from the pre-glacial placer deposits and reconcentrated in present day streams provides an indication of the preserved deposits.

Near the limits of glaciation, glacial erosion was reduced in intensity, and deposition of glacial debris dominated the glacial processes. In such areas, placer deposits have been preserved under thick deposits of glacial drift which must be removed before the gold

Figure 20: White Channel gravel deposits on a strath terrace along the Klondike River is overlain by a thick section of darker Klondike glaciofluvial gravel. Channels cut into White Channel gravel at the base of the glaciofluvial gravel.

Figure 19:

View along the upper reaches of Spruce Creek, east of Atlin. Glacial deposits have been reworked by glaciofluvial and post-glacial streams, forming placer gold concentrations. A wedge of tailings from a mining operation is at left centre in the photograph.

bearing horizons may be worked. Old hydraulic workings near Minto Lake northwest of Mayo, where gold-bearing gravel is overlain by 30 metres of glacial drift, exemplify this type of preservation.

Approximately 10% of the gold recovered from placer deposits in Yukon between 1978 and 1982 came from glaciated regions.

The influence of glaciation may extend beyond the glacial limit. For example, the lower reaches of Hunker and Bonanza Creeks near Dawson City are about 16 km (10 miles) beyond the limit of valley glaciers which extended down the North Klondike River. Gold-bearing White Channel gravel deposits there are, however, covered by 40 metres (130 feet) of barren glaciofluvial outwash gravel which was deposited in the Klondike River valley. Both the White Channel gravel and the overlying glaciofluvial Klondike gravel are shown in Figure 20.

Burial of deposits by detritus may occur due to processes other than glaciation. Detritus supplied by rapid erosion of uplifted areas may blanket entire valleys, such as those in the North Ladue River area shown in Figure 21. If the area is tilted during uplift, detritus supplied by rapid erosion may form a wedge thickening to one valley wall,

such as that in the Indian River valley near its mouth.

Figure 21: View of unnamed tributary of North Ladue River showing blanket of detritus which has filled the valley bottom. Note the accordant summits of the ridges in the background.

In permafrost areas, downslope movement of material on south-facing slopes due to freezing and thawing cycles in the surface layer may cause a wedge of colluvium and rock to form. As shown in Figure 22, such deposits force the stream against the north-facing slope of the valley. They may also bury placer concentrations in the stream bottom.

Deposits of wind-blown silt and decayed organic material, commonly called black muck, blanket gravel deposits in the valleys of many streams in Yukon. The deposits may be up to 20 metres (65 feet) thick. Fossils such as the bison skull and horns shown in Figure 23 are found in the black muck. Other fossils found in the Klondike area including remains of Yukon wild ass, horses,

Figure 22: View of unnamed tributary west of the Yukon River. Slumps caused by freezing and thawing of the surface layer on the south-facing slopes have pushed the stream to the south side of the valley.

Figure 23: Fossil bison skull and horns recovered from black muck on Sulphur Creek. There is approximately 100 cm (40 inches) between the tips of the horns.

sabre-tooth tigers, mastadons, and mammoths have been found to have lived between 22,200 and 39,900 years ago (Harington and Clulow, 1973). Eight of the thirteen species found are now extinct, while two of the others no longer live in Yukon.

Burial of placer deposits may also occur due to volcanism. Conglomerates in the Indian River and Sixty Mile River areas were covered by volcanic rocks about 55 million years ago. The volcanic rocks shown in Figure 24 covered placer deposits at Ruby Creek near Atlin 15,000 years ago.

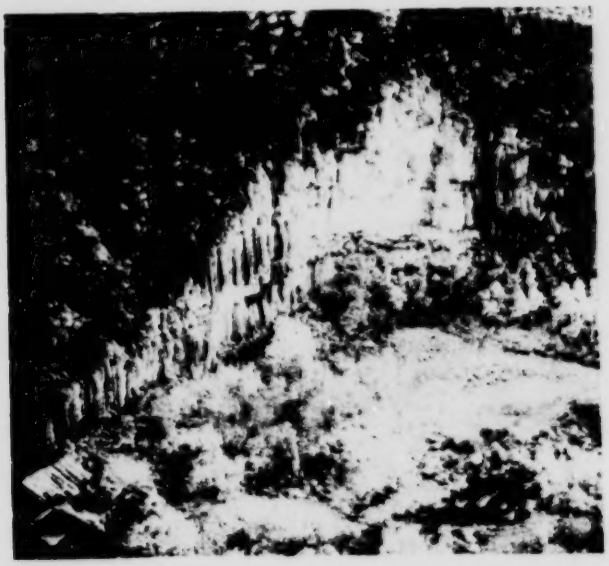

Figure 24: View of 15,000 year-old volcanic rocks with columnar jointing overlying gravel along Ruby Creek. Ruins from early mining operations are at lower left of the photograph.

Figure 25: Crystalline gold recovered from placer deposits at Bear Creek. The scale markings are 1 mm (.04 inches) apart.

Instead of being buried by subsequent deposits, some placer concentrations of placer gold have been uplifted, while the creeks have cut through bedrock to form new channels below their former levels. In some cases, the placer gold concentration in the creek at the original elevation is completely eroded and reconcentrated in the deposits of the creek at the lower elevation. In other cases, remnants of the placer concentrations are left on terraces at elevations 100 metres (330 feet) or more above the present creek levels. Buried placer concentrations may also subsequently be left on terraces when creeks cut through the deposits and bedrock to form new channels below their former levels. The White Channel deposits along Bonanza Creek shown in Figure 15 are of this type.

Tempelman-Kluit (1980) has described changes and reversals in flow direction of major rivers in southern and central Yukon, due to glaciation. Hundreds of changes to lesser streams could also be cited. These changes may have resulted even in the abandonment of channels with gold-bearing deposits. Careful examinations of aerial photographs may yield clues to the locations of abandoned channels.

Traditional thinking is that all the gold grains in placer deposits have been physically liberated from lode deposits. Recent evidence presented by Laken et al (1974) and others indicates, however, that gold may be dissolved and transported in surficial environments by naturally occurring chloride, thiosulphate, cyanide, humic, and other solutions. Effective reductants of gold in solution are some sulphide minerals, and carbonaceous material.

Although they are not common, gold crystals such as the ones shown in Figure 25 are found in unconsolidated placer deposits worldwide. They are most common in the oldest deposits. Incomplete crystalline forms with "chevron" shapes are found most often. Such forms are typical of gold precipitated from low-temperature solutions. In placer deposits, groundwater may act as a low-temperature solution which dissolves small amounts of gold and reprecipitates it. Tempelman-Kluit (1982) has suggested that the gold may be dissolved from bedrock underlying unconsolidated deposits. It may also be dissolved from placer concentrations in the unconsolidated deposits.

The effects of ground water on rock materials are illustrated by the large granodiorite boulder in Figure 26. The boulder is almost completely decomposed. The ability of groundwater to dissolve, transport, and redeposit iron is illustrated in Figure 27. The ability of groundwater to dissolve, transport and redeposit gold was illustrated by Boyle (1951) in his description of gold in an ice lens which formed during the last 10,000 years in the deposits at Giant Yellowknife mine at Yellowknife. Perhaps even more dramatic evidence of the ability of groundwater to dissolve, transport, and redeposit gold is provided by the copper nail shown in Figure 28. It was lost in underground workings on Miller Creek for about 80 years, and when recovered in 1982 it had a thin coating of gold on one side.

An understanding of the formation of placer deposits is useful in their evaluation and exploitation.

Evaluation of Placer Deposits

A variety of sampling methods and other techniques can be used to explore and evaluate placer deposits. Some of the methods and techiques described have been used in Yukon. Others have been used elsewhere.

Black and white aerial photographs at a variety of scales are available for most of Yukon. Limited coverage by colour and infra-red photographs is also available. Black and white photographs of large areas are used to identify regional features and areas of interest. Colour photographs of smaller areas are used to identify such things as abandoned channels. Different types of vegetation growing on the various substrata of the

abandoned channels and surrounding areas highlight the channels and facilitate their recognition. Infra-red photographs of small areas show some buried channels up to 12 meters (40 feet) below surface where the deposits are thawed. Permafrost may affect the ability of infra-red photographs to show buried channels.

Geological mapping of placer deposits is done to establish the distribution of the horizons bearing valuable minerals, and to determine whether conditions such as frozen layers, or large boulders, which might affect the mining method to be used, are present. Interpretation of the histories of deposition and preservation of the deposits can be done. Interpretation of features such as the ones shown in Figure 29, which indicate the deposits have previously been worked, can also be done.

Bulk samples are taken in order to determine the valuable mineral content of the deposits. They may be collected from specific horizons sampled from within pits or trenches, or they may be aggregates of the entire deposit.

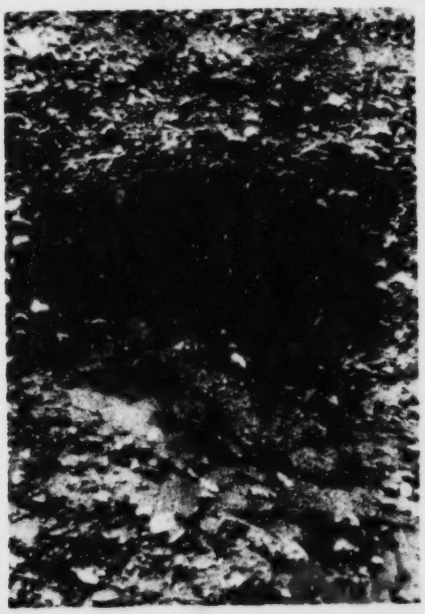

Figure 26: Granodiorite boulder in White Channel gravel along the Klondike River. The boulder is almost completely decomposed and is held together solely by the gravel surrounding it.

Panning is considered small-scale bulk sampling. The standard pan used is a flat pan, 40 cm (16 inches) in diameter, and 6.5 cm (2.5 inches) deep. The sides meet the bottom at an angle of approximately 140°. One level pan holds approximately .005 cubic metres (.007 cubic yards) of material, and can be treated by an experienced individual in approximately 6 minutes. It would require approximately 187 pans, or 19 hours' work, to test one cubic metre (1.31 cubic yards) of gravel with a pan. An excellent description of the uses and handling of a gold pan is given by Mertie (1954).

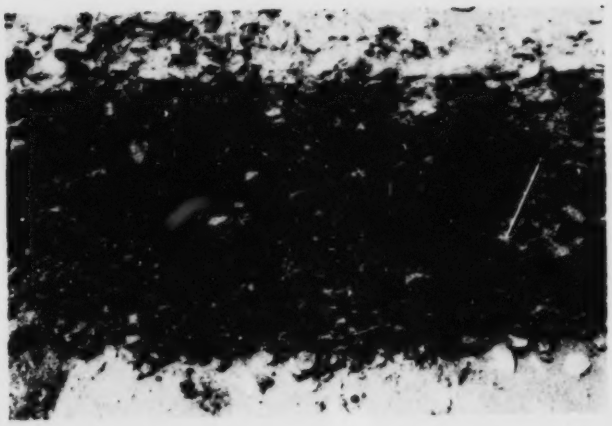

Figure 27: Quartz-rich gravel at Dominion Creek. Deposits for the 50 cm (20 inches) above bedrock are stained by iron oxides.

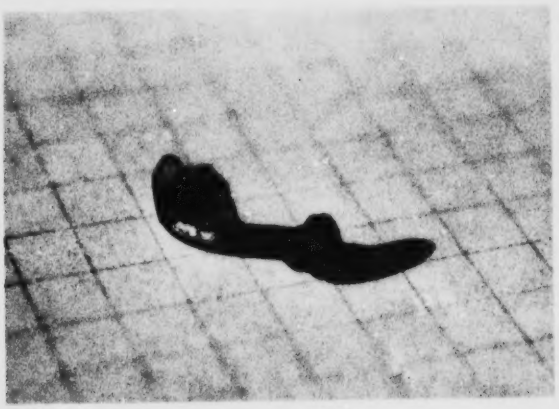

Figure 28: Copper nail recovered from old underground workings on Miller Creek. A thin plating of gold covers the convex side of the bent nail. The spaces on the grid paper are 5 mm (.2 inches) apart.

The amounts of valuable minerals in the concentrate may be described qualitatively as the number of "colours" of various sizes, or as a percentage of the concentrate, or quantitatively through weighing or chemically analyzing the amounts of valuable minerals obtained from one pan. To further quantify the results, the weight or volume of the gravel may be measured before panning is begun, so that after determination of the gold content, the results may be expressed as grams of gold per tonne, or ounces of gold per cubic yard. Samples of gravel collected from placer deposits of average grade should yield one gold grain .5 mm (.02 inches) in diameter, and weighing 2.5 mg (.00008 ounces) per pan.

Hand-dug trenches, pits, and shafts such as the one in Figure 31 were commonly used at the turn of the century to obtain bulk samples. Large mechanically-dug excavations are more common at present. The locations of the excavations are carefully noted, along with the

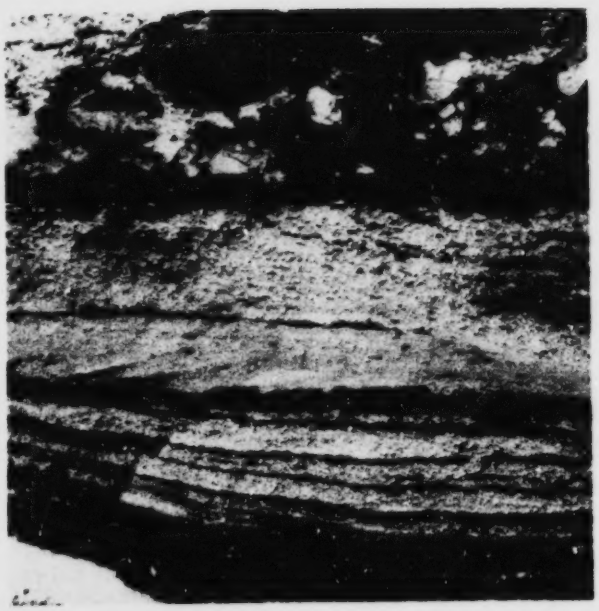

Figure 29: Deposits such as these are typical of dredge tailings. Fine-grained sand, silt and mud rest on bedrock, and are overlain by cross-bedded well-washed coarse sand and grit, and finally, by coarse boulders. The face in this cut is 1.5 metres (5 feet) high.

Figure 30: Panning to test the gold content of gravel.

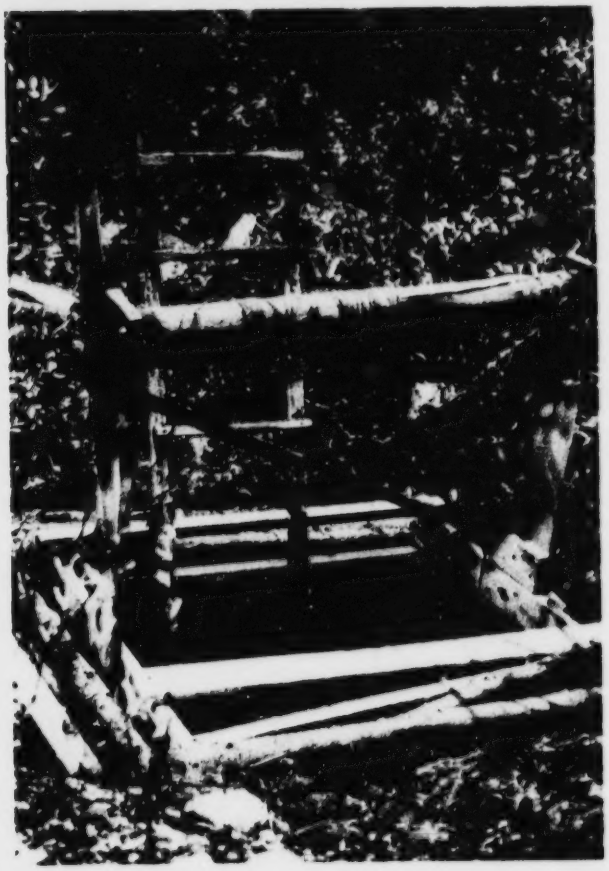

Figure 31: Mouth of hand-dug test shaft along Bear Creek. A bucket hung from the windlass was used to bring gravel from the shaft to surface.

positions of the samples from within the holes. The volume of every sample is measured, and each one is processed through a sluice box or other separating device. The heavy minerals concentrated from each sample are recovered, and the contents of valuable minerals present are determined. Bulldozers are used to dig shallow pits and trenches. Backhoes and excavators are used for deeper holes. In a test to determine the gold content of a large placer deposit in permafrost terrain in Russia, Vlasov and Zhelnin (1964) found that trench sampling was more accurate than pit sampling. In addition, they found that trenches were more useful in locating the margins of the valuable mineral-bearing zones than were pits, even where the pits were no more than 20 metres (65 feet) apart. Economic concentrations of heavy minerals were identified in trenches in areas which had previously been sampled by pits, and had been written off as not containing economic concentrations of gold. It was also found that the trenches could be spaced up to 25% farther apart than rows of test pits without a significant loss of accuracy in the information obtained. Wheeled scrapers, trench excavators, and bulldozers were used to dig the trenches during the Russian test work. Individual trenches were up to 300 metres (1,000 feet) long. The bulldozer was found to be the most suitable piece of equipment for the work. Deposits were stripped layer by layer from the bottom of the trench over a period of weeks, as the permafrost melted. The trench-digger was used in water-logged areas where the bulldozer could not operate.

Pits and trenches are arranged to sample sections across the length of placer deposits. Visual inspection of

the walls of pits and trenches can be done to determine the character and grain sizes of the gravel present. In addition, gold-bearing and barren sections of deposits may sometimes be found by simple inspection and panning of the trench walls. Bedrock may be exposed for inspection. In many cases, the results obtained from a few days of bulldozer trenching provide the information needed to decide whether or not more extensive exploration is warranted.

Drill sampling is done in deep, wet, or frozen deposits where sampling by pits and trenches is not practical. Many placer deposits, particularly those mined by bucket-line dredges, were tested by drilling. Various drills offer a range of bit and core sizes, depth capabilities, drilling rates, and drilling methods. Those most commonly used in North America to test placer deposits are described by Colp (this volume).

Samples from drill holes smaller than 15 cm (6 inches) in diameter are not useful for determining grade. Gold grains in placer deposits are generally fine-grained, and are randomly scattered. Figure 32 indicates the effect on grade calculations of one stray grain of gold weighing 1 mg (.00003 oz) in a section 30 cm (12 inches) long from drill holes of various diameters. Where the hole diameter is 30 cm (12 inches) or more, the effect of one such grain is negligible. Where the hole diameter is 15 to 30 cm (6 to 12 inches), the effect is greater, but it is still acceptable. Where the hole diameter is less than 15 cm (6 inches), the effect is so great that the results cannot be considered reliable. In a placer deposit of average grade, each 30 cm (12 inches) long section from a 15 cm (6 inch) diameter drill hole contains approximately 2.5 mg (.00008 oz) of gold.

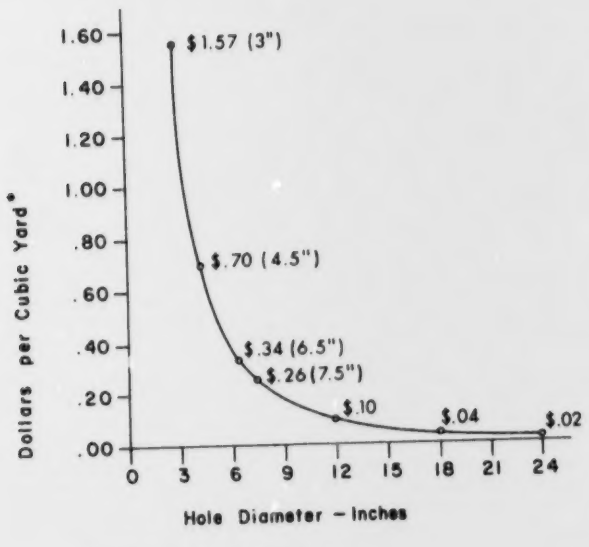

Figure 32: The effects of one stray 1 mg (.00003 oz.) particle of gold on grade calculations from drill holes of various diameter (after Wells, 1973).

Figure 33: View of mouth of 15 cm (6 inch) diameter drill hole. Samples from holes of this diameter and larger may be used to do grade calculations.

The arrangement and spacing of the drill holes are important. In narrow valleys, the holes are usually spaced close together along staggered lines across the valley, which are relatively far apart. In wide valleys, the spacing of the drill holes approaches equilateral triangles. In any case, the holes are arranged so that any detailed follow-up drilling will fit into the pattern of reconnaissance drilling.

In the Dawson City area, drill holes used to explore areas prior to dredging were generally spaced 60 metres (200 feet) apart along lines 150 metres (500 feet) apart, and arranged so that triangles were outlined by adjacent holes. This pattern and spacing means that there was one drill hole for every .94 hectares (2.33 acres) of ground (Hester, 1970).

Avery (1930) performed a "paper test", in which patterns of drill holes were overlain in different positions on a theoretical placer deposit to determine which densities of drill holes were sufficient to accurately define the content of valuable minerals in the deposit. He found that when the sample density was one hole per .4 hectares (1 acre), the maximum and average errors were 12% and 5% respectively. When the drill hole density was decreased to one hole per .91 hectares (2.25 acres), or approximately the density used in drill testing in the Dawson City area, the maximum and average errors rose only slightly to 18% and 8% respectively. The "paper test" also indicated that where the sample density was less than one hole per .94 hectares (2.33 acres), the maximum error rose sharply.

In addition to the careful planning which is done to choose the optimum spacing and location of drill holes, corrections are made to the apparent contents of valuable heavy minerals in the drill samples. This is because the samples occupy a larger volume after being disturbed by drilling than before being disturbed. Also, where casing is used, the sample appears to represent a wider interval than it actually does because the drill bits are generally designed to force a diameter of core larger than the inside diameter of the casing into the casing.

Geophysical exploration involves measuring various physical properties of the earth. The interpretation of the measurements allows conclusions to be drawn regarding the

character of the underlying rock and unconsolidated material.

Magnetometric surveys measure the magnetic intensity of the survey area. The application of vertical-field magnetometer measurements to the exploration and evaluation of placer deposits depends upon the association of magnetite concentrations with the valuable heavy minerals of the deposits. Magnetometric surveys are of no value in finding placers which contain insufficient magnetite, or are associated with large bedrock magnetic anomalies (Joesting, 1979). Test surveys done in Alaska indicate that where placer deposits contain sufficient magnetite, they can be recognized in unconsolidated sediments up to 112 metres (370 feet) deep, although the deeper the concentration is, the more difficult it is to recognize (Anderson and Johnson, 1970). Bedrock of various magnetic intensities, variable depths to bedrock, and variable depths to the concentrations of magnetite within the unconsolidated sediments all influence the results of magnetometric surveys.

Resistivity surveys measure the resistance of strata to an electrical current. In unconsolidated deposits, various layers may or may not have different resistivities. Where the resistivities differ, the geophysicist can use the results to draw a cross-section representing the survey line, showing the number of layers in the sediments, and their thicknesses and configurations. The resistivity of bedrock generally differs from that of unconsolidated deposits, so the position of bedrock can usually also be determined. Resistivity surveys are used to search for groundwater because the very high electrical resistance of water makes aquifers easy to identify. The temperature of unconsolidated deposits also affects their resistivities, especially when the temperature is less than 0°C (32°F). The high resistivities of frozen deposits prevent interpretations concerning stratification from being made, but allow determination of the extent and approximate depth of frozen deposits in areas of discontinuous permafrost (Joesting, 1979). Instrumentation is available which allows resistivity measurements to be taken within drill holes. The cost of geophysical drill hole logging is low with respect to the costs of drilling.

Gravity surveys measure minute differences in the gravitational force of survey areas. When applied to placer exploration, they can be used to indicate the general location and configuration of channels in bedrock. The presence of ice lenses, and unnoted changes in elevation, can seriously affect the results of gravity surveys. Gravity surveys are best used as a reconnaissance tool prior to seismic surveys.

Seismic surveys depend on the facts that shock waves bounce off discontinuities within the earth, and travel at different rates through materials having different properties. In seismic surveys, shock waves are sent into the ground by means of explosives, hammer plates, or other shock-producing mechanisms, and the times required for the shock waves to return to surface are recorded. If conditions are ideal, the layers within the unconsolidated deposits, their thicknesses, and the depth to bedrock may be determined. Seismic responses vary depending on the temperature and the water content of the material being surveyed. They are also affected by the presence of ice lenses. These factors can seriously hamper the interpretation of the results of surveys of shallow unconsolidated deposits. Seismic surveys of placer deposits in Alaska and Yukon are described by Greene (1970), and by Pullen and Hunter (this volume).

Biogeochemical surveys depend upon the tendency of some plants to concentrate certain elements in their cells, and the ability of the very sensitive analytical methods now available to measure such low concentrations of those elements. Such surveys have become popular in the search for lode gold deposits. During biogeochemical surveys, systematic sampling of a selected medium such as peat, rotting leaves, or particular parts of certain plants is done. The samples are dried or ashed, although some reports indicate that ashing causes some of the gold contained in organic materials to volatilize, and bias survey results. Biogeochemical surveys done over lode and placer gold deposits in British Columbia (Girling et al, 1979) indicate that the method outlines areas where anomalously high gold concentrations are present. In the one case where such a survey was tried on a placer deposit in Yukon, no anomalously high concentrations of gold were indicated. This may have been due to the fact that the unconsolidated deposits tested were more than 10m (33 feet) thick, while the plants collected had shallow root systems.

Exploitation of Placer Deposits

Placer mining methods used depend upon the characteristics of the deposit being mined, and the scale of the mining operation. Mechanized equipment commonly used includes tracked bulldozers, and wheeled loaders. Also used, but less common, are tracked loaders, wheeled front end loader-backhoe combinations, wheeled scraper-loaders, tracked backhoes, and wheeled bulldozers. Equipment in the 170 to 375 horsepower range is most common. Where more than one type of equipment is used, the models of each type used usually have approximately the same horsepower.

Water power is used where mine site conditions and environmental regulations permit. It may simply be the normal flow of the watercourse, or it may be under gravity or pump pressure. Water removes material from a mine site more economically than any other method. Its use is particularly suited to the removal of black muck, because black muck is not normally processed through gold recovery systems, will not support mechanized equipment when thawed, is expensive to remove with mechanized equipment when frozen, and washes away readily when submitted to a flow of water over a prolonged period of time. Water power is also used to undercut steep banks of gravel and cause their collapse.

In some parts of Yukon, deposits being mined are permanently frozen. The insulating layer of organic material covering frozen deposits is sometimes stripped up to several years before mining is begun, to allow the deposits to thaw. Tracked bulldozers with rippers are sometimes used to dislodge frozen gravel to promote thawing. After the gravel has thawed, the bulldozers push it into waste piles, or stockpiles, or push it directly into the gold recovery systems, as shown in Figure 34. Wheeled loaders sometimes mine material, and commonly feed the gold recovery systems with gravel obtained from stockpiles. Backhoes are also used to feed gold recovery systems from stockpiles. Wheeled scraper-loaders are used in large mining operations especially where the distance between the mining area and the gold recovery system is great. The equipment used for mining is also used to clear

tailings away from the gold recovery systems following processing.

Most operations of average size have two or possibly three pieces of equipment. Tracked loaders are usually used in small operations, in which they are often the only piece of equipment used. Most mining operations are open-cut or surface mines.

There is, however, one bucket-line dredge in Yukon at Clear Creek. It was active in 1980, 1981, and 1982. There are also three sites at Miller Creek, Dago Hill on Hunker Creek, and Jackson Hill on Klondike River at which underground mining was done at various times in 1980, 1981 and 1982.

The average placer mining operation has two or three employees. The average mining rate is 1,500 tonnes (1,000 cubic yards) per day, although mining rates of up to 15,000 tonnes (10,000 cubic yards) per day have been reached during the past few years. The average length of the mining season is 100 days. Work at some operations is done on two shifts. Little artificial lighting is required, because of the long days during the northern summers.

Some operations use primary classification systems to remove coarse material from the gravel before it reaches the gold recovery system. Such classification systems range from simple stationary iron grizzlies through oscillating iron plate gravel sorters to sophisticated multideck vibrating screening units. Primary classification systems have numerous benefits including increasing the effective throughput of the gold recovery system, reducing the amount of water required for processing by as much as half, sometimes eliminating the need for an employee to drag coarse material through the system, and enhancing gold recovery.

All the gold recovery systems used depend upon the high specific gravity of gold, and the action of flowing water to separate gold from gravel. The most common gold recovery system is the sluice box. Many designs of sluice boxes are in use. All have a dump box into which gravel is fed, and at least one long, narrow channel through which gravel is washed. The sluice box shown in Figure 34 has three channels. Coarse-grained material is washed through the centre channel, while fine-grained material is washed through the side channels. The side channels have a more shallow gradient than the centre channel, for optimum gold recovery.

Perforated steel plate (punch plate) in the dump box is used to separate the coarse- and fine-grained material in sluice boxes such as these. Punch plate is sometimes suspended over the riffles in single-channel sluice boxes, as shown in Figure 35, so that only material less than approximately 16mm (.63 inches) passes directly over the riffles.

Riffles may be placed longitudinally or transversely in the sluice box. Transverse placement is most common. Angle iron of various sizes, flat iron slats, grader blade,

Figure 35: Punch plate suspended over the riffles of a single-channel sluice box.

Figure 34: View of bulldozer pushing gravel into sluice box at Bear Creek, in August 1980.

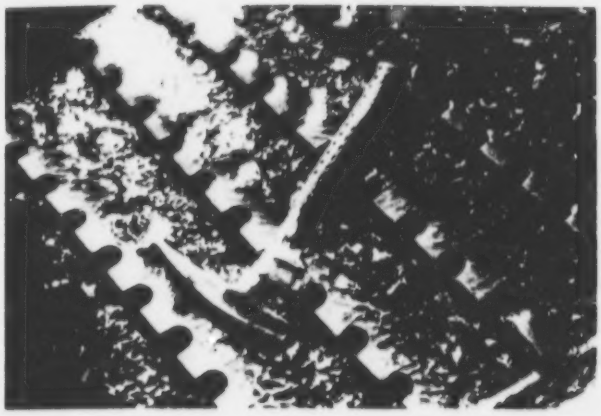

Figure 36: Grader blade riffles in place on the floor of a sluice box. The flow of water, when the box is in use, is from upper left to lower right.

and poles are commonly used as riffles. Figure 36 shows grader blade riffles in place in a sluice box. Riffles sometimes have holes in their tops, or small vanes or baffles attached to them to increase the turbulence in the sluice box. A discussion of the reasons for increasing turbulence in a sluice box is given by McCarter (this volume).

Expanded metal is usually placed under the riffles in a sluice box. It provides small irregularities in the floor of the sluice box, and improves the recovery rates of fine-grained gold.

Matting of some sort is placed below the riffles and expanded metal on the floor of the sluice box. Matting used includes cocoa matting, astroturf, and traction belting. Each provides traps for fine-grained gold.

Gold recovery systems other than sluice boxes, and the reasons for their use, are described by McCarter elsewhere in this volume.

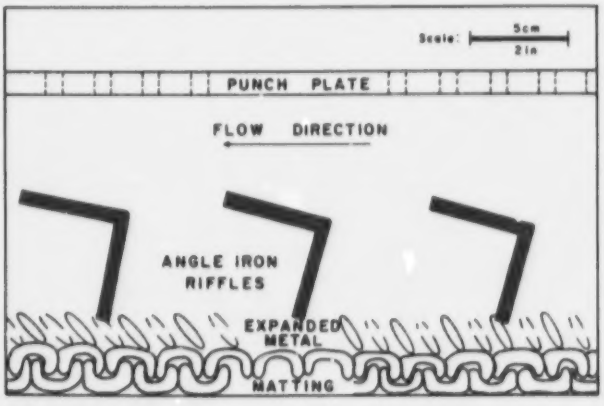

Figure 37: Schematic cross section of punch plate, riffles, expanded metal, and matting in a sluice box.

Heavy mineral concentrates recovered from sluice boxes are processed further to remove unwanted material. Processing is sometimes done in a small sluice box known as a "long tom", such as the one shown in Figure 38. It is sometimes done on a vibrating table with low, transverse slat riffles. Fine-grained gold particles trapped behind a slat on such a table are shown in Figure 39. Several commercial units of a variety of designs are also used for upgrading sluice box concentrates. Concentrates from long toms, shaking tables, and other devices are often further upgraded by panning. The marketing of concentrates is described by Hilchey (this volume).

Wastes from placer mining can be solid, or water-borne. Solid wastes from ground preparation and processing are usually stockpiled at the mine site. They may be rehabilitated to support new plant and animal life. Rehabilitation may include levelling of waste and tailings piles, distribution of fine-grained material over coarse gravel to provide a rooting medium for plants, and distribution of seed. If fine-grained material is present, plant populations will normally re-establish themselves. Plant populations subsequent to mining in permafrost regions flourish because they are present on a thawed substrata, rather than a frozen substrata such as was present prior to mining. The plant species present subsequent to mining are better suited to supporting moose and small fur-bearing animals than those present prior to mining.

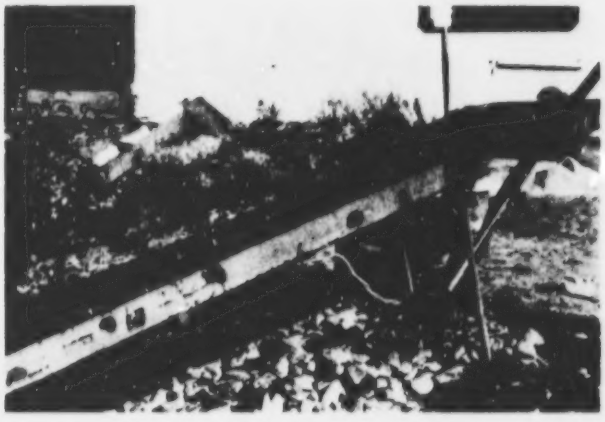

Figure 38: Small sluice box, or "long tom" used to upgrade sluice box concentrates. Expanded metal and astroturf cover the floor of this unit.

Water-borne suspensions resulting from ground preparation and processing are of concern because of their effect on the aquatic environment. Settling ponds are used to allow as much material as possible to settle from the suspension. In tests conducted in Alaska by R & M Consultants Inc. (1982), it was found that settling ponds are most efficient in removing particles .02 mm (.0008 inches) in diameter and larger from suspension. Such particles settled in 12 hours or less. Settling ponds were not efficient in removing particles finer than .02 mm (.0008 inches) in diameter. Such particles include fine silt, clay and organic colloids. To allow clay particles to settle from suspension, settling ponds with overflow rates of 1580

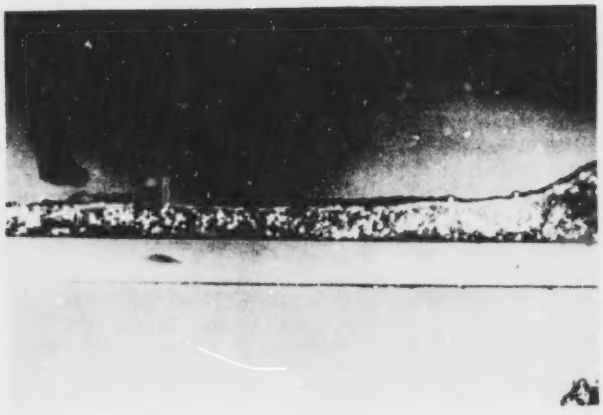

Figure 39: Fine-grained gold particles trapped behind a slat on a vibrating shaking table used to upgrade sluice box concentrates.

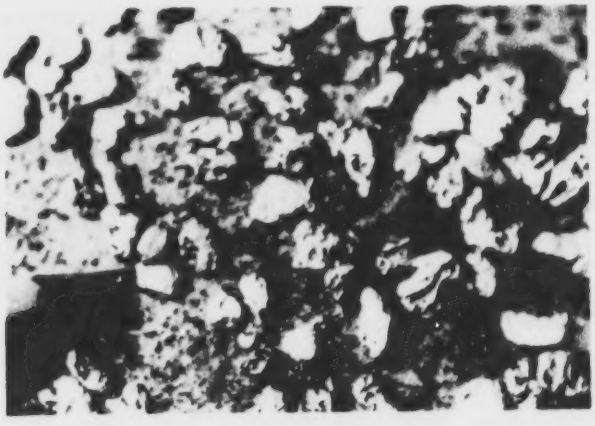

Figure 40: Nuggets recovered by the Queenstake Resources Ltd. dredge at Clear Creek. Pencil at left provides scale.

litres per minute per hectare (860 gallons per minute per acre) of pond area or less were required. The effectiveness of settling ponds in field situations was a function of the grain size distribution of the material being processed.

Flocculating agents have been jointly suggested by the Department of Fisheries and Oceans, and Environment (1983) as being of potential use in removing clay particles from water-borne suspensions. Field tests of the effectiveness of flocculating agents in removing clay from suspension have not been tried. One test in Alaska was done in which flocculating agents were used in an attempt to cause organic material in suspension to settle where water was used to strip black muck (Pers. Comm., S. Sexton, Alaska Dep't. Environmental Conservation, 1982). The chemicals were found to be ineffective and prohibitively costly in that test.

Factors affecting the cost of recovering gold from placer deposits include the characteristics of the deposit being mined. Geomorphologic constraints such as confined

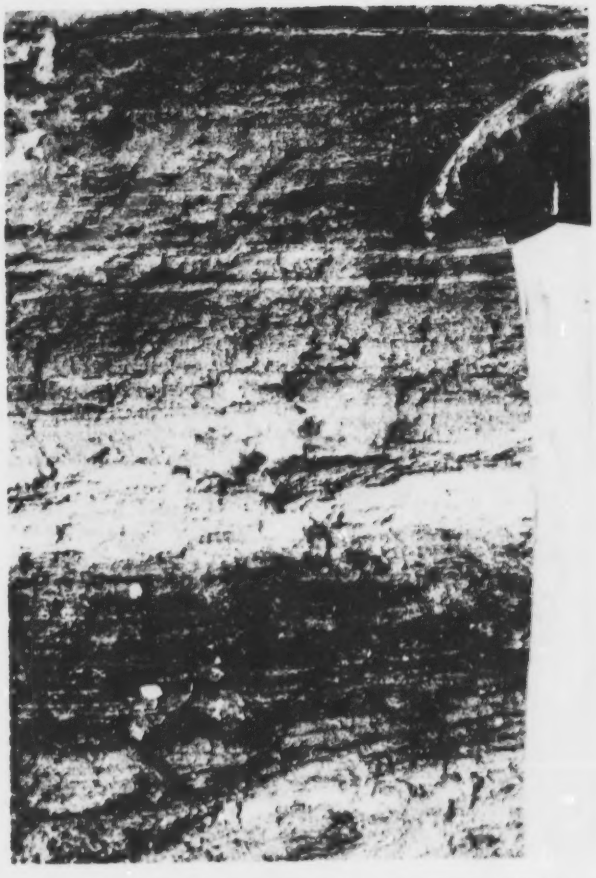

Figure 41: Finely laminated clay and silt deposited in a settling pond. Hammer at right provides scale.

work areas, large boulders, and permafrost may dictate the use of certain mining methods. Thick layers of overburden may force removal of material without gold, before gold-bearing deposits may be mined. Regulatory constraints may restrict the area to be mined, regardless of where the gold-bearing deposits are situated by prohibiting disruption of certain areas, or requiring waste-water treatment facilities within a property of limited size. Regardless of how much material is moved, however, the gold recovered from it must be greater in value than the total of all costs incurred in recovering the gold for the operation to be economic. It is thus important that as little waste material as possible is moved, that what is moved is moved as few times as possible, and that what is moved is moved as economically as possible.

Costs affecting placer mining have risen sharply over the past five years. Fuel and labour costs have doubled. Equipment costs have more than doubled. High interest rates have made loans for purchase of equipment prohibitively expensive. More strict environmental regulations have in some cases forced the use of more expensive mechanized mining methods in lieu of inexpensive methods using water, and have caused non-productive work to be done in construction and

maintenance of settling ponds, creek diversions, and fish passageways.

The rush to begin placer mining during the period 1978 to 1982 saw many operators begin work on ground that was too low grade to support an economic mining operation in earlier years, or on ground which had been mined once, twice, or even three times previously. The average grade of material mined between 1941 and 1959, including much previously unmined ground, was approximately 0.016 crude ounces per cubic yard (.66 grams per cubic metre). The average grade of material mined between 1978 and 1982 was very probably less than that.

Costs for mining operations in Yukon and the Atlin Mining Division of British Columbia vary from operation to operation. They ranged from $4.00 to $10.50 per cubic metre ($3.00 to $8.00 per cubic yard) in 1982, and were most often approximately $6.00 per cubic metre ($4.50 per cubic yard).

Costs per fine ounce of gold recovered ranged from approximately $220.00 to $585.00 in 1982, and most often were approximately $350.00 per ounce.

In comparison, costs per fine ounce of gold recovered at 28 Canadian lode gold mines in 1982 ranged from $120.00 to $455.00 per ounce, and averaged approximately $295.00 per ounce.

The value per fine ounce of gold increased from approximately $200.00 U.S. in 1978 to approximately $600.00 U.S. in late 1979 and 1980, declined to approximately $320.00 U.S. in 1982, and then rose again to approximately $400.00 U.S. at the end of 1982. Devaluation of the Canadian dollar between 1978 and 1982 had the effect of a further increase of 20 per cent in the value of gold.

When the price of gold rose to approximately $600.00 U.S. per ounce, the increase in the value of gold was greater than the increase in mining costs due to inflation. Even low grade deposits were profitable to mine. In 1981 and 1982, however, the situation changed. Increased mining costs approached, and sometimes surpassed the value of the gold recovered.

Table 1 lists Imperial, U.S., and Metric equivalents of weights and measures used by the placer mining industry. Table 2 lists the value per cubic yard of gold in gravel at a range of grades, and gold prices. It illustrates that at average 1982 mining costs of $4.50 per cubic yard, the value of gold required to "break even" when mining ground of average grade is approximately $325.00 U.S. per ounce. Where mining costs are higher than average, or the grade of the gravel is less than average, the value of gold required to "break even" is proportionately higher. For part of the 1982 mining season, the value of gold was less than $325.00 U.S. per ounce.

Table 1: Imperial, U.S., and Metric Equivalent of Weights and Measures

Measure		Equivalents	
1	Imperial gallon	1.20	U.S. gallon
	of water	0.16	cubic foot
		4.55	litres
		10.02	pounds
		4.55	kilograms
1	U.S. gallon	0.83	Imperial gallon
	of water	0.13	cubic foot
		3.79	litres
		8.35	pounds
		3.79	kilograms
1	litre of water	.22	Imperial gallon
		.04	cubic foot
		.26	U.S. gallon
		2.20	pounds
		1.00	kilograms
1	cubic yard	.765	cubic metres
	of bank gravel	3370	pounds
		1530	kilograms
1	cubic metre	1.307	cubic yards
	of bank gravel	4,400	pounds
		2,000	kilograms
1	acre	43,560	square feet
		4,047	square metres
		.404	hectares
1	hectare	10,000	square metres
		107,595	square feet
		2.47	acres
1	troy ounce	20	pennyweights
		480	grains
		1.097	ounces avoirdupuis
		31.103	grams

Table 2: Effects of Gold Content and Gold Price on Value per Cubic Yard of Gravel

Gold Content Per Cubic Yard	.014 crude oz.+	.016 crude oz.	.018 crude oz.
Gold Value	**Value of Gold Content**		
305. per oz. (250. U.S.*)	3.42	3.90	4.39
365. per oz. (300. U.S.)	4.09	4.67	5.26
425. per oz. (350. U.S.)	4.76	5.44	6.12
488. per oz. (400. U.S.)	5.47	6.25	7.03
550. per oz. (450. U.S.)	6.16	7.04	7.92
610. per oz. (500. U.S.)	6.83	7.81	8.78

+ gold fineness used is 800
* exchange rate used is 41.00 Cdn to $.82 U.S.

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DRILLING TECHNIQUES AND EVALUATION OF PLACER GOLD DEPOSITS

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Even though standard churn drilling techniques may be recommended in placer gold sampling programs, other methods may prove to be more satisfactory. It is necessary that other methods also be considered in an attempt to lower costs. The time required to drill a hole must be considered too, especially in the evaluation of potentially large economic auriferous gravel deposits.

Each placer deposit may have certain characteristics and ultimate requirements which will prevent any one technique from being considered "best". Consequently, several types of evaluation methods are described.

Churn Drills, Tools and Accessories

Up until the last few years, practically all placer drilling has been accomplished with churn drills of the type developed for drilling water wells. In general, the placer churn drill consists of either a rigid (one piece), or a telescoping type derrick which supports a crown sheave through which the drilling rope or cable passes. One end of the rope or cable is wound around a hoisting drum and the other end is fastened to the digging tools. Between the drum and the crown sheave is a mechanism (either a walking beam or a pulley on a crank) for alternately pulling up and dropping the line with its attached tools. This imports a churning or spudding action. The drum which holds the drill line is fitted with a brake strong enough to not slip even when the entire weight of the tools is bouncing on the end of the line. The drill is also equipped with a smaller friction driven drum on which a cable, usually 3/8" in diameter lowers and raises the pump or bailer for cleaning the cuttings from the hole.

The tools ordinarily consist of a rope or cable socket, a stem, and the bit. If extra weight is required, a sinker bar or short length of stem is added. These tools are cylindrical, usually 3" to 4" or 4-1/2" in diameter, and weigh between 800 and 3,000 lbs. The weight depends on the diameter and length of the tools, and on the length of the derrick and the drilling job it must accomplish. The tools are fastened together by pin and box (tapered male and female threaded parts) which are much stronger than ordinary threads. The bit is a cylindrical piece flattened and sharpened at the lower end. The exact shape of the cutting edge and of the bit depends on the type of ground that is to be drilled. Rock bits are heavy and thick and their cutting edges form a relatively blunt angle. Placer bits for chopping fine gravel are thinner and have sharper cutting edges. The sand pump, or bailer, is a cylindrical tube usually 4" in diameter and 6 to 8 feet long, with a hinged valve in the bottom. A plunger with a rubber or leather piston is attached through a rod to the cable (sand line). As the piston moves up, sludge or cuttings are sucked into the pump or bailer to be hoisted to the surface. Other tools that are usually necessary include a set of jars. Jars consist of a short stem constructed in two parts having 12" to 18" of end motion. They are used when there is danger of the bit sticking, as they provide either an upward or a downward jar which is very effective in extracting a stuck or sticking bit. A "bell" or "horn" socket may be necessary to pull a string of tools out of the hole. A rope spear may be necessary to catch the end of a broken rope or cable.

All of the drilling tools are round in cross-section, except for the lower part of the bit. In order for the joints to be tightened with heavy tools referred to as stem wrenches, a square section called simply a square, has been molded into each end of the tool parts. In order to tighten the drill stem to the rope socket for instance, the stem wrenches are placed on the squares in the correct position. The pressure necessary to tighten and/or loosen the joints is obtained with the use of a chain wrench bar or come-along.

In thawed ground it is necessary to use casing in order to keep the hole from caving during drilling. The casing must be made of the highest quality steel obtainable, as it must be driven and pulled many times during a season. It can be made up in five or six foot sections and in any diameter specified, usually 4", 5", 6" or 8". Heavy couplings were previously used to join the pipe sections. The threads were straight, so that the pipe butted up in the center of the coupling. Now, many drillers are using the "flush" joints type of casing sections. Male threads are machined on one end of the casing section and female threads on the other end. The threads are square or box-like in shape.

The drive shoe screws onto the first section of drive pipe going into the ground. This shoe is like a thick coupling with a shoulder against which the drill pipe butts, thus eliminating the stress on the threads. The bottom of the shoe tapers to the inside so that the cutting edge diameter is larger than the casing diameter. The drive shoe's cutting edge diameter for a 4" casing measures 5-1/4", for 6" casing the shoe measures 7-1/2", and for 8" casing a 9-3/4" drive shoe is used.

Another heavy piece called the driving head is screwed onto the upper end of the casing. It also has a shoulder which seals or butts against the top of the casing, thus preventing the threads from absorbing the blow. The drive clamps are two heavy pieces of iron, which when held together with two drive clamp bolts, grip the lower square on the stem above the bit. As the tools work up and down, instead of going to the bottom of the hole as in drilling, the drive clamps strike the driving head on the casing and drive the casing downward. Two special open end wrenches and a 3 lbs. single jack hammer are necessary to put on and take off the drive clamps.

The casing is usually pulled with a top puller. The bit is removed from the stem and a top puller substituted. This consists of a section of stem with a bumper block or hammer on the bottom and a cap or head that screws onto the casing through which the pulling mechanism can slide. The bumper block or hammer strikes the bottom of the pulling head on its upward stroke. Pulling in this manner is the most severe service the drill pipe must undergo,

Yukon Placer Mining, 1978-82, p. 35-42

because all the stress is taken by the threads. Ordinary pipe wrenches of the chain type (pipe tongs) are used to tighten pipe.

Casing can also be pulled with a mechanism that fits inside of the casing near the bottom of the hole. This is called a bottom hole puller. The bit must be removed from the drill stem and a set of jars added to the stem. The bottom hole puller is attached to the lower end of the jars and lowered into the hole. When it reaches the bottom, a quick upward blow with the jars sets the puller jar dogs onto the inside of the casing. Subsequent upward blows create the force necessary to drive the pipe out of the ground. A downward blow releases the pulling dogs so that the puller can be removed. This is a much better way to pull casing but the puller is very expensive and the upkeep is quite costly. It will, however, pull casing when the top puller cannot and it does not put the terrific strain on the casing threads that the top puller does. Some prospectors prefer to use ordinary water well casing cut in lengths 4-5 feet long for shallow ground. This type of casing requires a lot of cutting and welding as no threaded couplings are required.

Several makes and models of churn drills are available. When comparing the drills, one should remember that he usually gets what he pays for. As an example, a drill capable of driving a 4-inch casing produces a sample of less than half the area of a 6-inch casing. Likewise, the drilling capacity of light drills is far less than that of heavy ones, and more time is required to keep cheaply built drills repaired.

The C. Kirk Hillman Airplane Drill is perhaps the lightest drill in operation today. Its weight, less tools and casing, is between 1,600 and 1,800 lbs. It drives a 4 or 5-inch casing. Power is supplied with a 3 HP or a 5 HP Fairbanks Morse Engine. Its practical drilling capacity is about 40 feet, although deeper holes have been drilled.

C. Kirk Hillman also builds a large, heavier drill called the "Prospector". This drill weighs about 4,600 lbs. exclusive of tools. It is designed to handle 6-inch casing and is capable of drilling most placer deposits.

The Keystone Model 70 was one of the first churn drills developed in America. The earlier models were powered with steam engines but now probably all have been converted to either gasoline or diesel. Without tools this drill weighs about 6,600 lbs. It is capable of handling between 1,500 and 2,200 lbs. of tools. The derrick is 34 feet high. The drill is usually mounted on skids or a truck.

Several models of Bucyrus churn drills are made. Two models used in Alaska are the 20 W and the 22 W. The 20 W is the lighter, weighing between 3,000 and 4,000 lbs. without tools. It is capable of drilling to at least 100 feet with 6" casing, and is either truck or skid mounted. The derrick can be ordered as a rigid fixed length or a telescopic mast. The telescopic mast high position is 36 feet and the low is 24 feet. The tool cable is 5/8" and it has a 3/8" sand line cable. The tools weigh between 1,200 and 1,800 lbs. It can be purchased with a 4 cylinder 30 HP gasoline motor or a comparable diesel engine.

The 22 W is a heavier drill, weighing around 9,000 lbs. without tools. The tools weigh between 1,800 and 2,500 lbs. The drill is capable of drilling 6", 8", 12" and 16" holes. The tool cable is 5/8" or 3/4", depending on tool weight and drilling depth. It is powered with either a 6 cylinder gasoline or diesel unit in the 50 HP range. These drills are usually skid mounted but they can also be mounted on trucks or tracks. Skid mounting usually adds another 8,000 lbs. or so to the total weight.

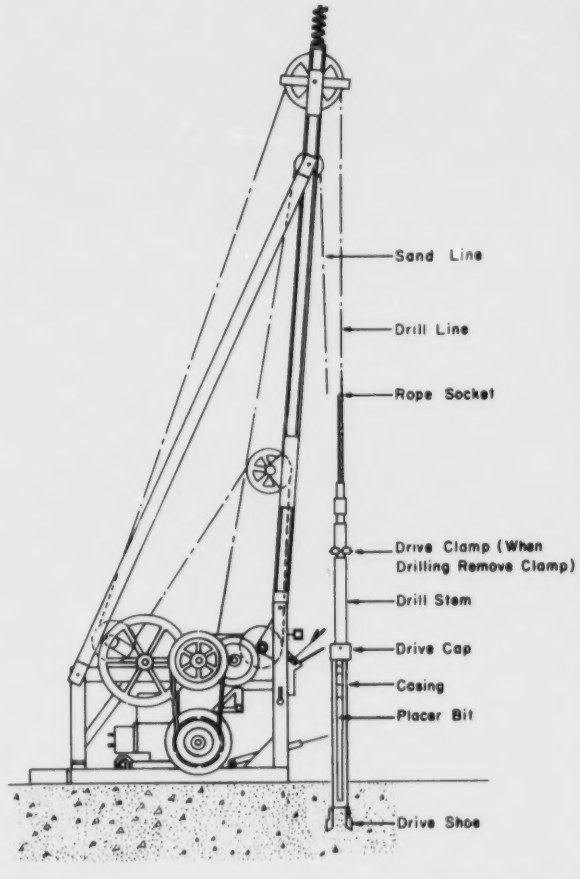

Figure 1: Basic equipment used in churn drilling (after Wells, J.H., 1973).

Churn Drilling Techniques

The overall operation of sampling placer ground with churn drills can be divided into 5 steps. They are driving, drilling, pumping, panning, and pulling. Driving provides a measurement of the core of gravel. The effective diameter of the drive shoe determines the area of gravel cut as the casing is driven into the ground. Drilling breaks or chops up the core with the drill bit and prepares it for removal from the casing. Water must be added during the drilling operation (unless the hole is making water) to make a sludge that can be pumped out of the hole with the bailer or sandpump. When the loaded bailer is hoisted out of the hole it is lowered into a mud box. There the contents of the bailer are washed out and the outside of the pump is

cleaned with water. Pumping is repeated until the hole is clean. The mud box discharges the sludge and water into a volume bucket where it is slimed and measured. The cuttings are then usually washed in a rocker and the rocker concentrates are further reduced by panning. The panner estimates the weight of gold recovered from each drive, and enters this information on the drill log for the hole. The driving, drilling and pumping sequence are repeated for each drive (usually a foot at a time) until the hole is completed. The engineer in charge weighs the total gold and calculates the value of the hole, usually in dollars and cents per cubic yard. The drive pipe or casing is then pulled out of the hole and the drill is moved to the next location.

In drilling, all the information required to completely describe a drill hole must be recorded on drill logs. The drill data are recorded in one of several columns, such as time of pumping, depth of pumping or casing before and after pumping, measured loose volume, theoretical volume, no. of colors, estimated weight of gold, character of material information, and remarks. In addition the drill log is dated, with the hole and line number, location, equipment used, driller and panner's name, etc.

Churn drillers should never drill and pump below the casing. A 2-3 inch plug at the end of the casing is sufficient in most cases. This assures the driller of true and representative samples. If he drills and pumps from below the drive shoe, he is pumping from an area larger than his drive shoe, and is contaminating his sample with foreign material. If extra gold gets into the sample because he pumped from below the casing, he is salting his sample. This is a condition every driller must attempt to avoid. Of course, if the drive pipe hits a boulder, then the driller must go below the shoe in order to try and break the rock, so that further drilling can continue.

Erratic drill cores can be a problem. A rock partially blocking the drive shoe may move downward with the pipe and force the material beneath it to one side, resulting in deficient core. Ground with occassional "tight" horizons also gives less core than it should when material packs in the pipe, and causes other material to be pushed aside. The core rise may be normal but subsequent pounding by the drill bit can push the core out of the casing so the pump picks up little or no core. Overpumping in loose ground brings excess material from below the casing. Hydrostatic water tends to push excess material into the casing.

Theoretically, a 1-foot drive with 6-inch casing using a 7-1/2-inch shoe should produce a 20.3-inch rise. In practice, the theoretical amount of core is rarely obtained. Instead, too much or too little for a given drive is obtained. The most important thing is that for a placer drill sample to be meaningful, it must take into account the amount of material "actually" obtained from any particular sample interval. In other words, if a drillhole increment contains too much core its value must be downgraded. If it does not contain enough core its indicated value can be upgraded. Many engineers base their adjusting method on either the ratio between the theoretical and the actual core rise, or the theoretical and the measured volume. The basic formula for the two methods are:

$$\text{Corrected gold weight} = \frac{\text{Theoretical core rise}}{\text{Actual core rise}} \times \text{Estimated Weight}$$

$$\text{Corrected gold weight} = \frac{\text{Theoretical core volume}}{\text{Actual core volume}} \times \text{Estimated Weight}$$

Down-The-Hole Hammer Drills

The Mission Hammerdril and Megadril are pneumatically operated down-the-hole or bottom-hole drills that efficiently combine the percussive action of cable tool drilling with the rotary action of rotary drilling. They can be used on any standard rotary rig with the necessary air-compressor capacity. They are used for fast and economical drilling of medium-hard to hard formations in mining, quarry, construction, water well, oil well, and for geophysical work and placer gravel sampling.

Fast penetration rates result from several factors. Because the Hammerdril and Megadril are bottom-hole tools, the piston blows are transmitted directly to the bit without losing percussive energy through the drill string. The compressed air is fully utilized for the rapid impacting action, and for blasting and lifting the cuttings from the hole. Continuous hole cleaning bares new formation to the bit so that practically no energy is wasted in chewing up cuttings.

Straight holes are assured by the short rapid blows which minimize the effects of contacting large boulders. From the writer's experience, Mission Button Bits or Megabits appear best for placer gravels, although "X" bits and "Drop Center" bits are available.

When thread connections are prepared for hammer drills, care should be taken to keep wire brush particles, dirt, and thread compound from falling into the hammer mechanism or tool. While the tool is operating, every precaution should also be taken to prevent dirt, rust, scale or other objects from getting into the drill string and into the tool. Before stopping the operation, always raise the tool off the bottom and blow it clean. If water or cuttings are in the hole, the tool should not be left in the hole as long as half an hour without circulating air.

An adequate air supply is essential to the proper and efficient operation of the Hammerdril and Megadril. The Mission Megadril is designed to operate on 100-200 psi and should not operate above 200 psi. To remove cuttings effectively, an annular velocity of at least 4,000 ft./min. is necessary. Velocities up to 4,800 ft./min. are preferred for placer gravels because of the high specific gravity of gold.

Proper rotation speed is important in achieving longer bit life and optimum penetration with down-the-hole hammer drills. A rotation speed of 10 to 25 rpm is recommended. The slower rotation should be used in the harder formations. The suggested rpms for Button Bits is 12-30.

For most down-the-hole drilling, casing is not necessary. The air and/or water injected down the drill tools passes out the bit. The cuttings come up the annulus

between the tools and the hole diameter. During placer sampling, however, this procedure cannot be used because particles of gold stick to the rough sides of the drilled hole. In order to effect a smooth surface so that the cuttings can be ejected, a casing must follow as close behind the bit as possible. In this way, air and/or water forced down the drill pipe will bring all the cuttings to the surface. They then enter a casing discharge tube which discharges into a cyclone. The cyclone receiving the cuttings discharges its load into tubs or buckets, after which volume measurements are made.

Both CP and Ingersoll-Rand drills have been converted from rotary to bottom-hole-hammer rigs in the Fairbanks area. Other types of drills may also be adapted for this method of drilling. These rigs are in the 40,000 lb. weight class when mounted on 4 wheel drive 6 x 6 trucks with large tires. The trucks are equipped with 3 hydraulic jacks, (2 aft and one forward) for leveling. Drilling depths to 150 feet are not uncommon. Depths to more than 200 feet should be possible depending on the compressor capacity and pulling capability of the drills.

Diesel Hammer and Center Sample Rotary Drilling

Both the Diesel Hammer drills and the Center Sample Rotary (CSR) drills discharge their drill cuttings by reverse circulation, opposite to the bottom hole hammer drills just described. Both are made by Becker Drills Inc., and can be truck mounted or on track or skids.

The hammer drill consists of a double wall pipe which is driven down by a diesel-operated pipe hammer. Air and/or water under pressure is forced down the annulus of the drive pipe. Material cut by the drill bit is transported to the surface through the inside pipe by the drilling medium. Discharged material can be accumulated in suitable containers as it emerges from the cyclone. This allows collection of samples at specific intervals. The center of the drive pipe is always clear and the bit always remains at the bottom of the hole.

The track mounted Becker 180 hammer drill weighs about 48,000 lbs. and can travel about 2 miles per hour. Its height in travel position is 9'4". Its maximum length is 23'8", with a track length of 12'8", and its maximum width is 8'9". The steel-framed support sled, which can be towed by the drill, carries the drill pipe and the cyclone. The drill pipe consists of two concentric 6-5/8" outside diameter by 4-7/16" inside diameter heavy duty tubes, made up in 8-foot lengths weighing about 650 lbs. each. The pipe has flush joints with API threads and a ring of drilled holes in each joint in line with the annulus to permit air and/or water passage. The pipe, with a patented cast steel shoe measuring 6-5/8" outside diameter and 4" inside diameter, is driven into the ground with a Link Belt diesel hammer delivering 93 blows per minute at 7,600 ft. lbs. per blow. The diesel hammer unit with guides on either side and an anvil block loosely attached at the bottom, is suspended on roller chains and is raised and lowered with hydraulic power. The driving force is applied to the top of the anvil block which is recessed to rest on top of the drive pipe. This mechanism contains an outer chamber for delivering air and/or water into the annulus between the two tubes and an inner chamber from which the drilled material is discharged.

During drilling, air and/or water under pressure is introduced into the annulus through the holes in the drive pipe joints to the drive shoe and hence to the inner pipe. Materials penetrated by the cutting edge of the drive shoe are thereby lifted upward more or less continuously during driving, and are discharged through the anvil block into the cyclone through a flexible hose. The cyclone is a cylindrical hopper with funnel shaped sides. Both top and bottom are open. Excess air discharges upward through the circular opening in the top of the cyclone. The solids and water drop downward through the circular opening in the cyclone into sample containers.

The driving head and pipe are handled with hydraulic power. Drill pipes are pulled out of the ground with slips and two hydraulic jacks which produce about 60 tons of lifting force. Two types of drive shoes may be used, both which have an outside diameter of 6-5/8" and an inside diameter of 4". One is referred to as a "Crowd-Out" type and the other is called the "Crowd-In" type. The "Crowd-In" shoe should produce a larger volume of material.

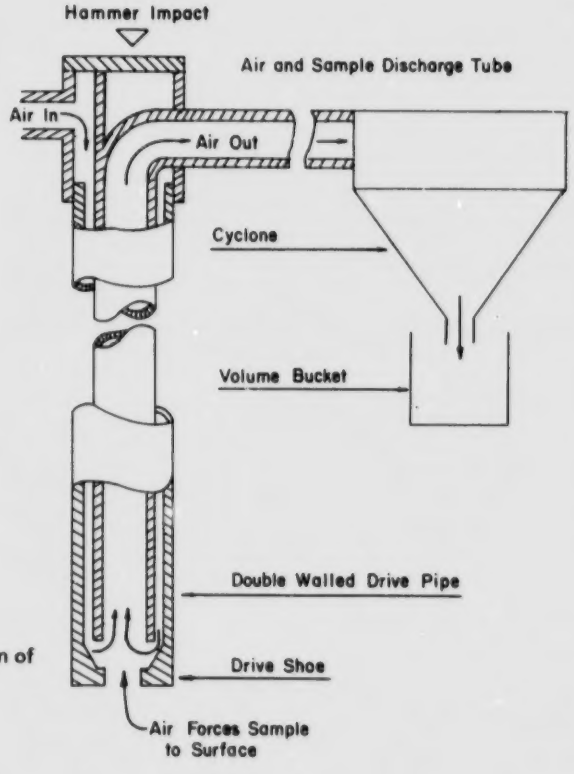

Figure 2: Driving head, bit, and sample return system of Becker Diesel Hammer drills.

The hammer drill has a high rate of penetration. It normally requires from 2 to 8 minutes to drill an 8 foot interval, depending upon the character of the ground and the number of boulders encountered. A 10-hour shift should drill 100-150 feet of hole.

The Becker CSR drills are similar to the hammer drills in many respects, but the drilling is accomplished by rotary methods, and the bits are usually standard tri-cone rock bits. Three sizes of double wall drill pipe are available. All are too small for placer sampling in the writer's opinion. A CSR drill mounted on tracks has a gross weight of 36,000 lbs.

Sonic Drills

Hawker Siddeley Canada Inc. began work in 1974 on development of a high frequency vibratory drilling system which uses a powerful mechanical oscillator to generate the drilling action. This form of drilling, called "sonic" or "resonant" drilling, is based on patents held by Dr. A.G. Bodine of Los Angeles, California.

The sonic drill functions and performs in a mode substantially different from that of conventional drilling equipment, and also from that of the more common low frequency vibrational machines with frequency ranges of 25 to 30 Hz. It is designed to vibrate the drill column along its longitudinal axis close to its natural frequency, which is generally in the range of 100 to 150 Hz. The drilling action provides a core sample of the material being tested.

The drill head contains an oscillator, air spring isolator, and rotational drive. The oscillator, which is the vibrational force generating unit, consists of two counter-rotating out-of-balance rollers which are timed and synchronized to provide vertical sinusoidal forces and motion at frequencies up to 150 Hz and peak force levels of ± 48,000 pounds. The axial reciprocating motion generated by the oscillator is isolated from the drill head case and rig structure by means of an air spring consisting of a large diameter piston set within a closed cylinder. The air spring can be used to apply direct pull down or pull up forces to the drill string. The drill head is capable of low speed rotational motion. This rotary movement may be superimposed upon the vibrational motion of the oscillator to assist the vibratory drilling action. It also provides a method of readily attaching and removing threaded pipe sections. The operational frequency range of the drill head is 70 to 150 Hz. Its dynamic force output at 120 Hz is 30,000 pounds, and its torque output is 32,000 in. lbs. at a maximum speed of 60 r.p.m.

The drill penetration is a result of one or more of three basic actions. They are displacement, shearing, and fracture by impact. Displacement drilling occurs in particulate materials. The drilling action "fluidizes" particles in contact with the drill column, and causes them to move out of the way and allow the drill pipe to pass. Displacement drilling only occurs in materials which have sufficient free volume to accept the material displaced. Plastic materials such as clay are penetrated by shearing action. For this to occur, the force and related vibrational amplitude must be of sufficiently high magnitude to overcome the elastic nature of the material. Fracture by impact is associated with the penetration of rock and large boulders. The vibrational velocity of the drill tip causes fragmentation. To provide "fresh" rock surfaces to the drill bit, continuous rotation of the drill string is usually superimposed upon the basic vibrational action. In almost all cases when drilling rock, rock fragments must be removed by a flushing medium. The action of the drill when operating in this mode is similar to that of a down-the-hole hammer.

The mode of drilling during placer sampling is usually a combination of displacement and fracture drilling, although in frozen ice-rich areas, local melting is also important. For placer gravel deposits up to 70 or 80 feet deep, a simple drill tool system consisting of 6 inch inside diameter drill rods connected by external couplings, a carbide insert reinforced drill bit, and a threaded adapter to connect the drill rods to the drill is used. Penetration rates in frozen and unfrozen placer gravel are generally about 2 feet per minute.

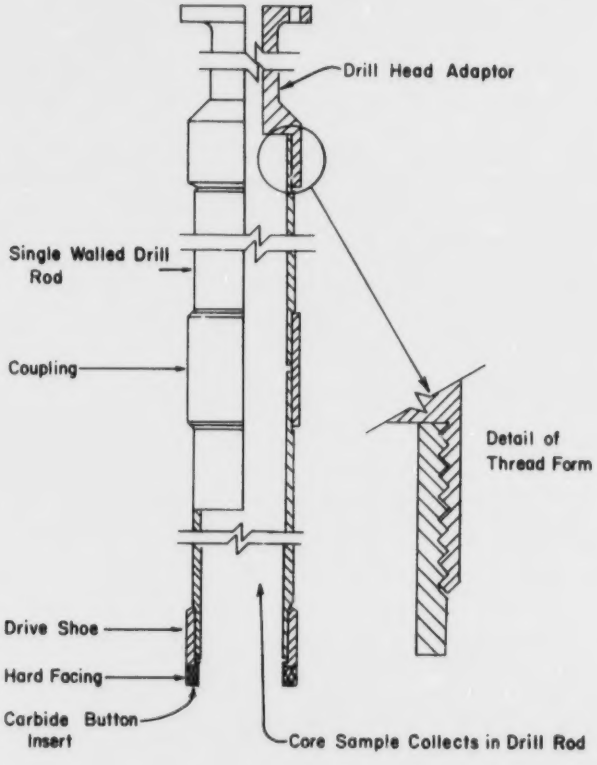

Figure 3: Drill rod column and bit of Hawker Siddeley Canada Inc. Sonic drills.

The length of core which can be taken at each pass varies according to the material being sampled. Under ideal conditions, up to 30 feet may be taken. To avoid loss of the sample, a spring catcher assembly must be used to hold the core in the drill rods in some cases. Removal of the core is usually done by vibrating the drill rod, and allowing the core to slide out into bins or bags.

For deeper sampling operations, a drill tool system utilizing an outer drill string similar to that used for shallower deposits, with an additional inner core tube and rod may be used.

Down-The-Hole Hammer, Diesel Hammer, CSR and Sonic Drill Techniques

It is critical that the sample processing method is able to keep up with the sampling technique. Hammer,

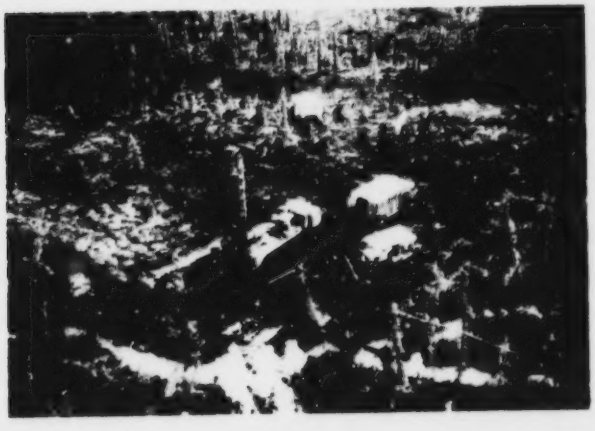

Figure 4: Becker Diesel Hammer drill and support equipment testing deposits on the North Ladue River.

CSR, and Sonic drills are fast-drilling units. They produce much larger volumes of material than do churn drills. A rocker and gold pan cannot keep up with the volume of material coming out of the hole. Therefore, more elaborate sample treatment systems are needed. The Denver Gold Saver, equipped with a long-tom, and the Pan-O-Matic Gold Panning Machine are among the suitable commercially manufactured sample treatment systems.

Clam Type Drills

A clam type drill known as the Yost Klam has been patented by Merrill and James Yost of Rancho Cordova, California. This drill is capable of drilling holes 36-inches in diameter to depths of 100 feet or more, depending on the character of the ground. The drilling unit uses a clamshell type excavating tool to dig the material from within the confines of a 36-inch casing. Open holes can also be drilled, providing the ground is sufficiently tight to prevent caving. The truck mounted Klam unit weighs about 42,000 lbs. Casing sections are 36-3/4" outside diameter by 36" inside diameter by 5 feet long. They are made from 3/8" plate steel. Each 5 foot section of casing weighs about 730 lbs. The cutting or drive shoe is welded to the bottom edge of the lowest section of casing. It is made from 7/8' plate steel rolled to a nearly perfect 36' inner diameter dimension. The shoe depth or length is 6", the lower edge of which has a 45° inward beveled surface which results in a 37-1/2" cutting diameter. The clamshell type bucket is a specially designed air actuated mechanism. The whole mechanism weighs about 4,000 lbs. It will excavate volumes up to 1-1/2 cu. ft., drive the casing, and pull the casing when the 60 ton hydraulic jacks are insufficient.

Another clam drill is the Hochstrasser-Weise caisson drill. It is made in Germany, and has been patented world wide. The basic elements of the H-W system are the specially designed 3 cu. ft. capacity digging clam, and the 12 ton swinghead mounted on top of a 40 foot high caisson. It also includes a 50 ton truck-mounted crane with a 90 ft. boom, 600 cfm air compressor and sample bins.

The weighted swinghead, linked to the top of the caisson by a casing drivehead, rotates horizontally through a limited arc. Compressed air cylinders initiate the rotation. The swinghead engages a set of latches fixed to the top of the casing, and stops at the end of a 40° swing. Upon impact, the angular momentum of the swinghead is transferred to the casing, causing it to twist in the direction of the original swing of the head. At this point, the compressed air is diverted through a valve arrangement to the compressed air cylinders, initiating rotation in the reverse direction. Each impact delivers a torque of 430,000 ft. lbs. The cycle is repeated 30 times per minute, moving the casing 1 to 5 inches in either direction. The caisson's movement serves to break skin friction along the walls.

The clam weighs 5,000 lbs. and has a cycle time of 45 sec. The combined weights of the swingframe and caisson and the continuous twisting action enable the cutting shoe of the drill pipe to sink steadily below the leading edge of the digging clam. Casing is recovered from the hole by lifting the entire assembly with the crane, while the swinghead osciliates to break the skin friction. Recovery can be facilitated by closing the opening in the swinghead and pressurizing the caisson with compressed air. This adds an upward thrust, which is one of the advantages of the H-W system.

Caissons

Caissons can be used as a method of sinking shafts by hand in either wet or dry ground. They are cylindrical steel shells sunk into the ground to act as cribbing as the excavation proceeds. Caissons are not standardized. Usually the prospector has them made to his own specifications. As it is difficult to work in a shaft less than 3-1/2 feet in diameter, the smallest section (the one at the bottom) should never be smaller than that. Each section can be either four or five feet long, with the longer ones being used near the top. The sections may be solid cylinders, or split to make them easier to transport and install. If they are made from flat steel, they are usually 4 feet high. When made from corrugated culvert pipe they can be any length. A convenient length to handle is 5 feet. Each section is usually 2-3 inches smaller in diameter than the one above. Thus, they telescope one inside the other. If split sections are used, they are made to overlap a

couple of inches, and joined by bolts with rectangular heads. These heads are of a shape and size to pass through rectangular slots in the shell. The bolt is turned 90° and tightened, putting the long dimension of the bolt head across the slot, and locking the two parts of the section together. A porta-power hydraulic press is very helpful for this operation.

The caisson is started by digging a hole large enough to take the topmost section, which is the largest. If the prospector estimates that his ground is not more than 30 feet deep, he may choose to begin his hole with a 60-inch diameter caisson section. By the time he gets to the bottom, his caisson section will have decreased in diameter to about 42-inches which is about as small an area as he can conveniently work in. The top section is wedged in and backfilled. The next smaller section is lowered into place inside the top section. The top of this section has a rim of heavy strap iron, round rod or angle iron around the outside, which butts against a similar rim around the inside at the bottom of the section above and prevents the lower section from sliding below the upper one. As the man in the hole excavates the gravels, the man on top hoists and dumps the bucket. Telescoping caisson sections are added as the hole is deepened until bedrock is reached.

Sometimes it saves time if the sections are driven. For this work a special weighted rod is attached to a curved shoe which is moved around the top of the section as the section is being driven.

If the flow of water in the test pit becomes too great, and cannot be bailed out with the excavated material, a pump must be used. In this case a sump must be deepened to receive the pump suction so that the rest of the shaft bottom can be kept relatively dry. Samples excavated with a pick and shovel from under water are almost useless, so all seepage water must be kept away from the gravels to be sampled. The caisson cannot be driven ahead of the digging, but must be kept as close behind the digging as possible, to minimize the amount of material washed into the hole by hydraulic pressure. Moss and rags can be stuffed around the bottom of the caisson to help keep outside material from entering.

Solid caisson sections are removed by pulling with a chain hoist on a bridle attached at three points. If split or half sections are used, the bolts are turned so that the sections will collapse and then removed. As each section is removed the hole is filled in so that the man in the hole is protected from caving by the caisson section above him.

Hand Dug Test Pits

These excavations are similar to caisson holes but are usually shallower in depth. If the ground caves easily they must be timbered or cribbed as the hole is deepened. If holes are dug in frozen ground a boiler or wood fires must be used to thaw the hole prior to excavating.

After the prospector has decided where to sink the hole, the moss and top soil are removed with an axe or grubhoe. The hole is squared up to about 3 feet wide by 5 feet long and a collar of logs against which moss and dirt are banked is laid around it. The collar keeps rocks and dirt from falling into the hole, provides more room for dirt removal, and forms a good foundation for the windlass.

A No. 2 round point long-handled shovel, cut to about 3 feet, a miner's pick and a sledge hammer are the only tools required. As soon as the hole is too deep for the dirt to be thrown out, a windlass is built. The windlass bucket is made from either wood or steel. The steel bucket is safer and can be used to hoist water as well as dirt. The wooden bucket is square, about 12 to 18-inches across, about 15-inches deep and tapered toward the bottom. It is built with 1" lumber. Two 1" holes are drilled near the top on each side, and a rope threaded through them, so that the pull is taken up by all four sides.

The steel bucket is usually cylindrical, about a foot in diameter and a foot or 18-inches deep, made of 16 guage steel, with strap iron reinforcements around the top and bottom. The bale is made of 3/4-inch round iron, fastened to ears on each side of the bucket, with a loop on top, to fit the bucket hook exactly in the center. The bucket hook is made of iron in a shape such that it cannot be accidentally unhooked. It is called a serpentine hook or pigtail, and makes a 360 degree curve. A 3/4" manila rope is strung from this pigtail fastened to the bucket bale to the windlass with enough rope wound on the windlass drum to assure reaching the bottom of the proposed prospect hole.

Backhoe Excavators

A backhoe is a good tool to sample shallow placer deposits. A typical small backhoe will dig 10 to 12 feet deep and will load a truck 11 or 12 feet high. A small backhoe bucket has more than 7,000 pounds of digging force and generates a prying force of 15,000 pounds or more. Larger backhoes can dig to 36-40 foot depths with a range of bucket sizes that provide cutting widths from 24-48 inches.

In some placer gravels the walls of backhoe-dug pits or trenches stand well and can be sampled by cutting a vertical channel in the face of the standing material. Where the presences of large rocks or ravelling ground precludes the use of channel cuts, either all excavated material or alternate buckets can be set aside as a bulk sample.

Caisson Hole, Clam Hole, Hand Dug Test Pit, and Backhoe Pit Techniques

The total volumes of material removed by these methods of testing ground are usually quite large, so the samples are processed in small specially built concentrating plants or in manufactured washing equipment. The processing can be done in 1-foot increments, 5-foot increments, or whatever the engineer in charge decides best. Normally, a cubic foot of undisturbed gravel from the center of the hole is panned or rocked separately for every foot of depth. This gravel has not be salted by material rushing in from outside the hole.

The loose volume occupied by this cubic foot of gravel is measured to determine the swell factor. By measuring the total loose volume for each foot of depth, and decreasing that volume by applying the swell factor to get the volume in place, it can be determined whether much material is coming in from outside the hole. If much material is entering, the value per cubic yard obtained from the hole will not be accurate and must be adjusted accordingly.

If a pump is used to dewater the hole, it may remove an appreciable volume of sand. It may be necessary to pump the water into a tank so that the sand can settle. The loose volume of sand can be then measured and added to the total volume that came from the hole, in order to calculate a reasonable true cubic yard value.

Bulldozer Trenches

Bulldozers can also be used to dig trenches for prospecting shallow placers. Since a bulldozer is more effective as a pusher than as a digger, it is best suited to sampling ground less than 12 feet deep and with a pushing distance not exceeding 200 feet. The hydraulic blade is considered best for digging prospect trenches as it provides a positive downward pressure, and in fact it allows much of the tractor's weight to be put on the blade while digging hard ground. The cable-controlled type blade has only its own weight to hold it down, and as a rsult its cutting edge has a tendency to ride over any hard spots in the bottom of the trench.

A big advantage to be gained in prospecting placers by bulldozer trenches is that they permit first hand inspection of the ground. The character and size of the gravel may be visually determined. The pay or barren sections may also be found by inspection and panning of material from the trench walls. A considerable area of bedrock can be exposed for inspection or testing in comparison to smaller pits or drill holes. The results obtained from a few days of trenching with a bulldozer can provide the information needed to decide whether or not a more extensive sampling method must be initiated.

Bulldozer Trench Techniques

Bulldozer excavations are usually sampled by taking channel samples from the walls of the cut. The samples are then processed in a rocker from which the concentrates are panned. If larger samples are deemed necessary, a Denver Gold Saver or some other similar concentrating unit could be considered. The idea behind all sampling techniques is to sample as large a quantity of material as is practical. Small amounts or single pan samples are usually not representative of an area.

SEISMIC TESTS OF PLACER DEPOSITS IN AREAS OF PERMAFROST

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Hammer seismic refraction and reflection tests were carried out at sites in the Klondike and Clear Creek areas in June, 1982, in an attempt to evaluate the effectiveness of seismic methods as an exploration tool for placer deposits in regions of permafrost. This project was a result of interest generated at the "Placer Mining Short Course" (Whitehorse, April 20-22, 1982). The original intention was to select a site in the Dawson City area where other geophysical methods could be tested at a later date. It was soon apparent, however, that there was no "typical" placer area which would constitute a suitable test site. Seismic tests were therefore carried out at several different sites which cover a range of the types of placer deposits present in central Yukon.

The placer gold deposits in the test areas are found at the interface between bedrock (chloritic schist) and overlying gravels, and in the overlying gravels. At the contact, the bedrock is often highly altered. It may be "soft" and friable over a zone as thick as 1 to 2 metres (3 to 6 feet). The gravels above bedrock vary from as little as 1 to 2 metres (3 to 6 feet) in thickness in some of the creek beds to more than 100 metres (330 feet) in thickness in some of the hillside bench deposits. Above the gravels is an organic-rich silty layer commonly referred to as "black muck". Except for a thin surface "active layer" which thaws during the summer, the "black muck" and underlying gravels are frozen.

Seismic methods

Seismic methods involve the generation of energy at one point, and the measurement of the time taken for this energy to travel along various paths to a series of detectors. These detectors, or geophones, are usually set up in a line with their spacing determined by the type of seismic survey being done, and the depth of the target horizon. For shallow seismic work, the energy source is often a sledgehammer striking a metal plate set firmly on the surface, or a small explosive charge embedded in the ground. The energy radiates outwards from the source in the form of waves whose velocity depends on the physical properties of the subsurface material. At interfaces between strata with different physical properties, part of the energy is refracted and passes into the lower stratum, and part of it is reflected back towards the surface. The geophones record the arrivals of waves that have been reflected or refracted from various interfaces. The travel times of the waves, together with the distances between the energy source and the geophones, can be used to calculate the thicknesses of the subsurface strata, and the velocities of the waves in them.

Refraction seismic methods are based on the time of arrival of the first energy at a given location. When the velocity of the wave of energy in the various strata increases with depth, the shortest travel time corresponds to a wave that has been refracted along an interface between a low- and a higher-velocity medium. As the source-detector distance increases, the first arrival corresponds to waves refracted from deeper interfaces. Reflection seismic methods involve the measurement of the times of arrival of later events which correspond to energy that has been reflected from subsurface interfaces.

Until recently, seismic surveys of shallow deposits have been based exclusively on refraction techniques. However, the development of seismographs that allow digital storage of data, and the combination of these units with microcomputers, have made the interpretation of reflection data from shallow deposits possible. In non-permafrost areas where overburden exceeds 30 m (100 ft) in thickness, the "optimum window" seismic reflection technique has proved to be a viable method for mapping the unconsolidated overburden/bedrock interface (Hunter et al., 1980, 1982).

Application to Yukon Placer Deposits

The placer gold deposits in the test areas are found at the interface between bedrock (chloritic schist) and overlying gravels, and in the overlying gravels. At the contact, the bedrock is often high altered. It may be "soft" and friable over a zone as thick as 1 to 2 metres (3 to 6 feet). The gravels above bedrock vary from as little as 1 to 2 metres (3 to 6 feet) in thickness in some of the creek beds to more than 100 metres (330 feet) in thickness in some of the hillside bench deposits. Above the gravels is an organic-rich silty layer commonly referred to as "black muck". Except for a thin surface "active layer" which thaws during the summer, the "black muck" and underlying gravels are frozen.

In theory, refraction seismic techniques should be a viable method of mapping a shallow bedrock surface under the conditions described above, unless a thawed zone (and hence a velocity inversion) is present in the surficial deposits (Hobson, 1966). Problems which were anticipated, and which did cause difficulty in some places, were that significant anomalies in travel time can result from local variations in the thickness of the active layer, and from underground workings dug in the permafrost by early prospectors.

Reflection seismic tests were carried out in areas where the gravels are thick to determine whether the "optimum window" technique could be used to map the interface between frozen unconsolidated overburden and bedrock in permafrost areas. Since acoustic velocities in permafrost are much higher than in equivalent unfrozen material, the presence of frozen overburden theoretically narrows the "window" in which it is possible to observe the seismic reflection from bedrock. It was not known before these tests just how severe this restriction might be, and whether it would preclude the use of the reflection seismic technique in evaluating placer deposits in areas of permafrost.

Yukon Placer Mining, 1978-82, p. 43-45

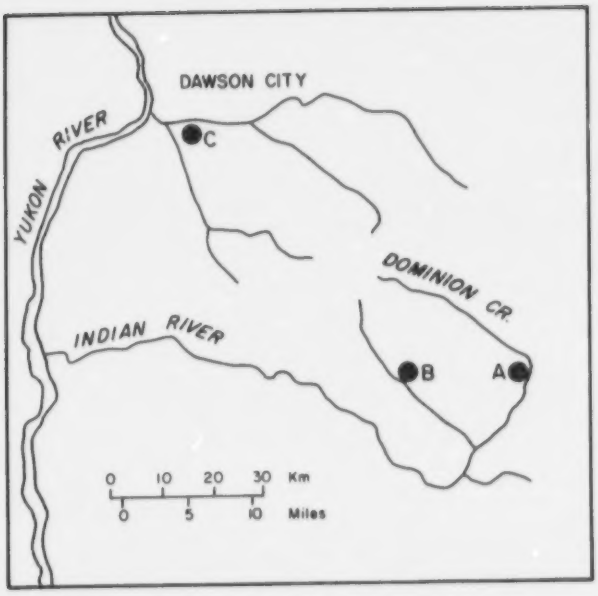

Figure 1: Locations of test sites in the Klondike area.

Refraction Seismic Surveys

Refraction tests were carried out at two sites where some subsurface information was available from drill logs. At the Dominion Creek site (site A), approximately 3 metres (10 feet) of "black muck" overlie 6 to 9 metres (20 to 30 feet) of gravel. The surface has not been disturbed. This is one of the few areas where it is reasonably certain that there are no underground mineshafts or drifts.

The refraction data obtained at this site were good, particularly where it was possible to plant the geophones and the hammer plate directly in the frozen material below the thawed surface layer. The frozen silty organic material was characterized by an acoustic velocity of approximately 2500 m/sec (8000 to 9000 ft/sec) and was found to be approximately 3 metres (10 feet) thick. Below this, a layer approximately 6 metres (20 feet) thick with a which corresponds to frozen gravel, was found. The velocity of the bedrock was estimated to be 5500 m/sec (18,000 ft/sec). The contrasts in acoustic velocities in this section are quite sufficient for refraction seismic work.

The Teck Mining Company property on Sulphur Creek (site B) was the second location at which a seismic refraction test was done. There is excellent drill control over the whole property. The refraction test was conducted along a line of drill holes perpendicular to Sulphur Creek, in an area which had been bulldozed to remove its vegetation cover, but not stripped of "black muck". It was estimated that the surface "active layer" had thawed to a depth of 1 metre (3 feet). It was impossible to plant the geophones or plate in frozen material below the thawed section.

Several problems were encountered, and the data were uninterpretable. There was a severe static problem, especially in the areas which had been most disturbed by the bulldozer. Poor coupling of the hammer plate and the geophones with the surficial deposits, and low signal levels made it difficult to obtain any records at all in areas where the ground was particularly spongy.

In a shallow seismic experiment in the Klondike area in 1966, Hobson also found that the "active layer" "presented operational problems". He attempted to plant the geophones in the frozen subsurface by attaching them to a steel stake and driving that through the thawed layer, and to couple the hammer with the top of the permafrost by striking a stake driven into the frozen material. However, even these methods were described as only "partially successful" and Hobson concluded that explosives were required.

The results obtained at the Dominion Creek site show that it is indeed possible to map the bedrock interface using seismic refraction techniques. Those obtained at the Sulphur Creek site point out that the statics associated with the "active layer" and/or subsurface anomalies can present overwhelming problems in some cases. It is strongly recommended that surveys be carried out when the ground is frozen to the surface in order to avoid the static problems associated with the "active layer". Better coupling might be achieved by using an explosive source rather than a hammer and plate. In most cases a more powerful source than a hammer will be necessary for refraction seismic work when the overburden exceeds 15 metres (50 feet) in thickness.

It should be noted that the refraction seismic technique would have failed to "see" the thin gravel layer at the Sulphur Creek site, even if other problems had not been encountered. The drilling data shows that 8 metres (26 feet) of "black muck" overlie a layer of gravel 3 metres (10 feet) thick. A synthetic seismogram calculated from this information indicates that the thin gravel layer is a hidden layer. The depth to bedrock would be slightly under-estimated by a two-layer refraction analysis.

A situation which was not encountered by the refraction seismic surveys, and which may not be a common occurrence is the presence of a thawed zone within or below the gravel. This would result in a velocity inversion in the section, with the result that the depth to bedrock could not be accurately calculated.

Reflection Seismic Surveys

Reflection seismic surveys were conducted at two sites where the thickness of overburden exceeds 30 metres (100 feet). Subsurface information from drilling was not available at either site.

At the Jackson Hill site (site C) a good section across the unconsolidated overburden is exposed at the hydraulic mining operation of Universal Exploration Company. The section is approximately 100 metres (330 feet) thick. Seismic tests were carried out on a cleared area at the top of the section. The first arrival of acoustic energy on the reflection seismic record was interpreted as being a combination of the refraction and wide-angle reflection off the top of the frozen gravel. Immediately after the first arrival, there was a strong event characterized by a velocity of 1700 to 1800 m/sec (5500 - 6000 ft/sec). This was interpreted as a ground wave that was transmitted along the surface of the frozen overburden. This second

arrival and the "rolls" that followed it masked any reflection information which might occur later in the record.

A site in the Clear Creek valley, approximately 100 km (63 miles) east of Dawson City was the location of the second reflection seismic test. In contrast to the Dawson City area, the Clear Creek test area has been glaciated. The section again consists of an organic layer and gravel overlying bedrock. The test area was undisturbed. Bedrock crops out in the hills on the east side of the creek, but the thickness of the gravel in the valley was not known. The same interference problems which prevented the determination of the depth to bedrock by reflection seismic methods at Jackson Hill were also encountered at Clear Creek. The overwhelming event on the seismic records was the wave which travelled along the surface of the permafrost. No reflection from the bedrock surface could be seen through this interference.

The results obtained at Jackson Hill and Clear Creek show that the "optimum window" shallow reflection seismic technique is not a viable method for mapping the bedrock interface in placer mining areas of Yukon where permafrost exists. The high velocity "ground roll" associated with the top of permafrost narrows the "window" so drastically that it becomes impossible to separate the bedrock reflection from all other events.

Acknowledgements

Steve Morison (DIAND, Whitehorse) helped considerably with the organization of field work. George Gilbert (Claims Inspector, DIAND, Whitehorse) and Bob Whittingham (Claims Inspector, DIAND, Dawson) escorted the crew on an initial reconnaissance of the Klondike area and provided invaluable insight into the problems of evaluating placer deposits in regions of permafrost. Thanks are also due to Gerry Klein (Property Manager, Teck Mining Group Ltd.) for his interest in the tests, and for allowing ready access to drill log data.

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PLACER RECOVERY

by
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The placer mining industry has recently been rejuvenated due to the increase in the price of gold. The most common gold recovery system used is, however, the sluice box, which has not changed significantly for many years. This paper outlines the functions and limitations of sluice boxes, and describes other gravity concentrating equipment developed in the tin and mineral sands industries.

The Sluice Box

The sluice box has been in use for centuries. Nature demonstrates the simplest form of sluice box, in stream channels. Discontinuities in the stream bottom act as riffles, concentrating gold and other heavy minerals, and creating placer deposits.

Over the years, man has improved upon the stream with respect to the materials of manufacture, shape of channel, and method of riffling in sluice boxes, but the principles of operation remain the same.

The classic sluice box is an open channel with a riffled bottom. Transverse angle iron riffles, as shown in Figure 1, are the most common.

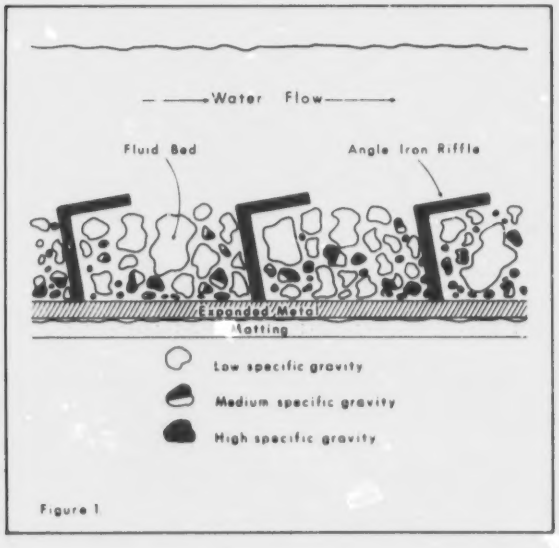


Figure 1: Cross Section of riffles in sluice box.

Expanded metal and some type of matting are usually installed below the riffles. The gravels to be processed are mixed with water at the head of the sluice, in what is commonly called the dump box. The resulting slurry then runs down the sluice and the gold, being heavier than the other minerals present, settles in between the riffles. Such a simple and robust system is appreciated by miners as it will run a long time without mechanical breakdown.

There are, however, problems, such as inherent downtime. The sluice box is a batch-type machine. It must be shut down periodically so that the heavy concentrates can be removed from the riffles for further processing. Depending upon the operation, this lost working time can amount to a high percentage of the available hours.

It is found in practice that the more often the concentrate is removed from the sluice, the more efficient is the recovery. Accordingly, the ideal method implements continuous cleaning.

Even if a sluice were cleaned continuously, however, it would still not catch all the gold. When the gold grains are coarse and round, they are effectively concentrated, but when the gold grains are fine or flat, the recovery leaves much to be desired.

To understand why a sluice box loses gold, the method by which it works must be studied. Sediment transport in water is a field which has come under intense research. The results can be readily applied to the sluice box.

Placer gravels are made up of many different sizes of particles varying in specific gravities. Particle sizes in standard Tyler screen mesh sizes, and mm are listed in Table I for reference.

Table I: Particle sizes

Mesh Number	Aperture (mm)	Mesh Number	Aperture (mm)
2.5	7.925	32	0.495
3	6.680	35	0.417
3.5	5.613	42	0.315
4	4.699	48	0.295
5	3.962	60	0.246
6	3.327	65	0.208
7	2.794	80	0.175
8	2.362	100	0.147
9	1.981	115	0.124
10	1.651	150	0.104
12	1.397	170	0.088
14	1.168	200	0.074
16	0.991	250	0.063
20	0.833	270	0.053
24	0.701	325	0.044
28	0.589	400	0.037

Yukon Placer Mining, 1978-82, p. 46-49

The rate at which a particle falls through water is predicted by either Stoke's or Newton's Laws. Figure 2 shows that large particles of low specific gravity fall at the same rate as small particles of high specific gravity. The rate of fall of particles is also affected by their shapes. Flat grains fall more slowly than do spherical ones. Figure 3 illustrates the effects of shape on settling velocities of gold particles less than 1 mm (.04 inches) in diameter. Specific gravity, grain size, and grain shape are thus all important in determining the rates of fall of particles.

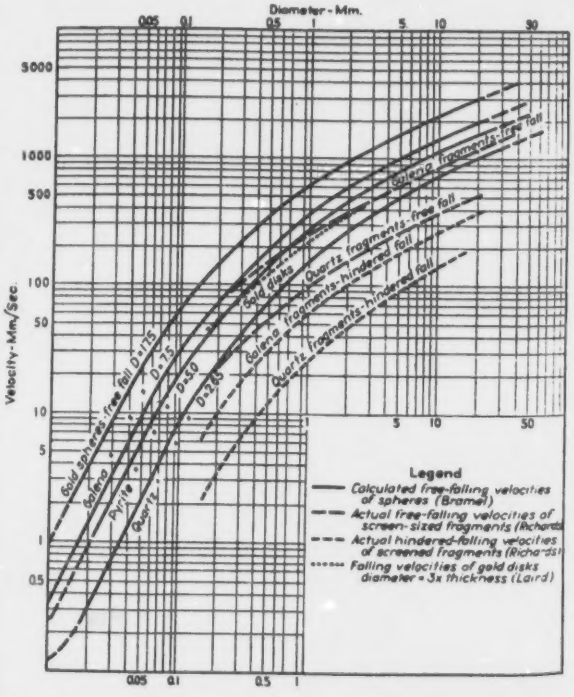

Diameter - Mm.
Velocity - Mm/Sec
Legend
Calculated free-falling velocities of spheres (Bramell)
Actual free-falling velocities of screen-sized fragments (Richards)
Actual hindered-falling velocities of screened fragments (Richards)
Falling velocities of gold disks diameter = 3x thickness (Laird)

Figure 2: Chart showing settling velocities in water of gold, galena, pyrite, and quartz grains of various sizes and shapes (after Hague, 1940).

Water flowing smoothly and slowly has laminar flow. In effect, it has different layers or laminae of water moving at different velocities built up upon each other. In the rate of fall of particles, it is as if the water were still. Any particle dropped into the water will eventually touch the bottom.

When the flow velocity of water is increased, the flow becomes turbulent. Eddies in the flow can hold small particles in suspension. As the flow velocity is further increased, the size of the particles which can be held in suspension also increases.

The high flow velocity of water used to move rocks through sluice boxes causes losses of gold. Some of the finest gold particles are carried by turbulence through the sluice box and into the tailings.

Part of the cause of this is that gold is hydrophobic. It is not wetted by water. If there are air bubbles present

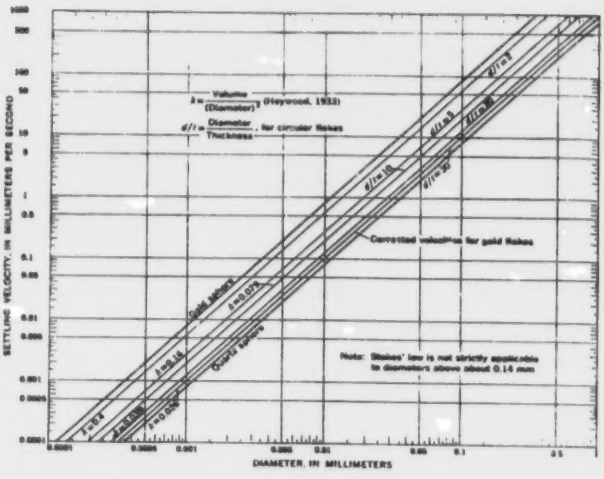

SETTLING VELOCITY, IN MILLIMETERS PER SECOND
DIAMETER, IN MILLIMETERS
Corrected velocities for gold flakes
Gold spheres
Quartz spheres
Note: Stokes' law is not strictly applicable to diameters above about 0.14 mm

Figure 3: Chart showing settling velocities in water of gold grains of various degrees of flattening, and quartz (after Tourtelot, 1968).

in the slurry, the gold will tend to adhere to them. If the gold is fine-grained enough, the air bubbles will float it to the surface where it will stay, and be carried out of the sluice box. Turbulent flow in the sluice box is therefore not totally desirable.

Other problems arise when the flow velocity is decreased. The most obvious problem is the loss of the ability of the flow in the sluice box to transport large rocks. Either they must be removed by hand, or they must be screened off.

In addition, the gold must be able to penetrate the grains between the riffles in order to be caught. Turbulence in the flow stirs or "boils" the grains between the riffles, keeping them in a semi-fluid condition. If large grains are screened off, and the flow velocity reduced too much, the grains between the riffles begin to pack solid. When this occurs, the gold remains in the main stream of the sluice box, and is carried out the end.

Riffle scour is another problem caused by high flow velocities, as gold that has been caught in the riffles is brought by turbulence back into the main flow, from which it can be carried into the tailings.

This presents a dilemma. If the velocity of the water is increased, gold is lost to turbulence. If the velocity of the water is decreased, gold is lost due to rapid filling of the riffles. Optimum recovery is achieved when the flow rate is just fast enough to keep the riffles from packing.

Classification of gravel prior to sluicing through the use of a grizzly, screens, or punch-plate is one way to optimize gold recovery. Other types of equipment which are more effective than the sluice box in the recovery of fine gold may also be used.

The Jig

In a jig, the optimum condition of having the flow

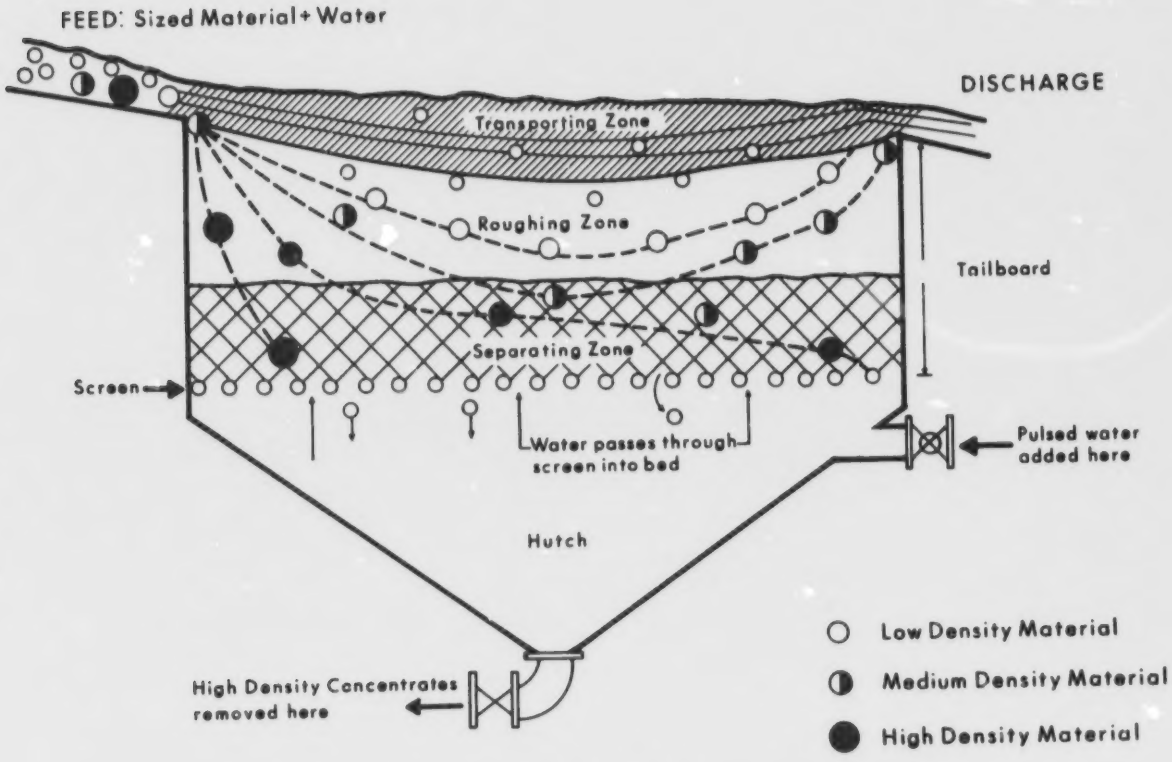
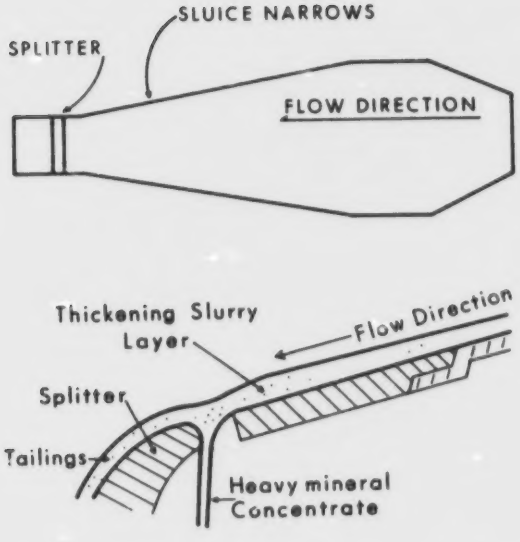


Figure 4: Cross-sectional diagram of a jig, showing the paths of particles of various densities.



velocity reduced to nil, while maintaining the fluid condition of material trapped by riffles is achieved. The pulsating action of the jig lifts the entire bed of particles off the screen surface. As the stroke reverses, the bed tends to fall bottom layer first, next layer next, and so on. This dilation of the bed effectively fluidizes it so that the high specific gravity particles can sink through it and be concentrated. The jig is a continuously cleaning device as small particles pass through the screen and are collected in the hutch. Nuggets are caught on top of the screen. Particles larger than 2 cm (.75 inches) have a high enough settling rate that they are not discarded to tailings, so they clog and reduce the capacity of the machine. Classification of the feed is necessary to keep a jig operating at optimal efficiency.

Although the jig, shown in Figure 4, is a better recovery mechanism than the sluice box, it is not perfect. Fine gold is lost due to the low residence time in the jig and the back flow of water from the hutch upward through the bed.

Figure 5: Plan and cross-sectional diagrams of a pinched sluice, showing the separation of high density material from low and medium density material at the end of the sluice.

The Pinched Sluice

A high capacity concentrator that will catch fine-grained gold is called the "pinched" sluice. It uses another approach to improve upon the sluice box.

Particles on the bed of a sluice box have a lifting force on them similar to aerodynamic force. The velocity of water is higher at the top of the particle than at the bottom. This creates a low pressure area on top of the particle which "lifts" it up. The particle is then carried downstream until it again hits bottom. This process is called saltation. It is repeated over and over until the particle leaves the sluice box. Particles of high specific gravity tend to stay close to the bottom, producing a layered effect. If the pinched sluice has laminar flow, the layers become well defined, with virtually all the heavy minerals on the bottom. When such a sluice is narrowed or "pinched" at the downstream end, the depth of the flow is increased making the layers easier to separate into concentrate and tailings.

Particles larger than 1.65 mm (.06 inches) tend to roll rather than saltate. This destroys the layering effect, making classification necessary. To keep the layers stable, the pinched sluice must be operated with an even, dense feed. If this is done, very high recovery rates may be achieved.

Recovery Rates

Recovery rates of fine grained gold were determined by Wang (1979) for a conventional sluice box, a jig, and a shaking table (a fine gold recovery device not discussed here). The higher recovery rates of fine-grained gold of the jig and shaking table compared to the sluice box are illustrated in Figure 6.

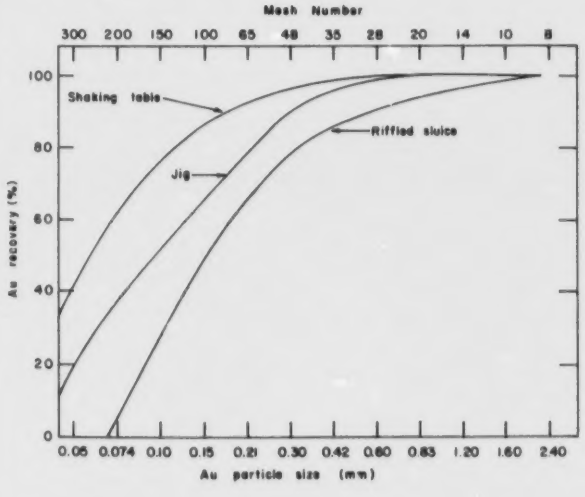


Figure 6: Recovery rates of fine-grained gold for sluice box, jig, and shaking table (after Wang, 1979).

There are many other devices available which are capable of concentrating heavy minerals. Each has its own size range of capabilities. In every case, it is necessary to feed the device in an appropriate manner to obtain optimum recovery. In most cases, this means classifying the feed material. Figure 7 indicates the size range applicability of commercial gravity concentrating units.

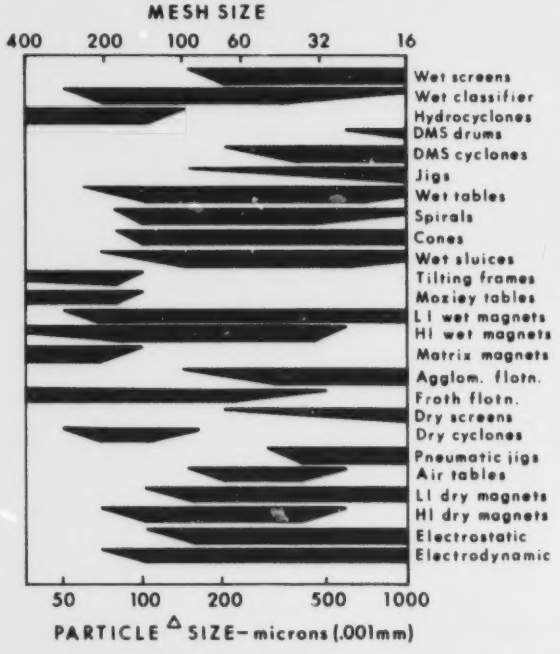


Figure 7: Grain size range applicability of commercial gravity concentrating units.

The aggregate industry has been in the business of classifying gravel for many years. The technology needed for application to the placer mining industry is readily available.

In these days when placer deposits with coarse-grained gold have been exhausted, and fine-grained gold is what remains, the classic sluice box must be modified in order to obtain the highest rate of gold recovery.

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MARKETING PLACER GOLD

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Presented at the D.I.A.N.D. and K.P.M.A.
Placer Mining Short Course, Whitehorse, Yukon,
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After cleaning up, most placer miners have some nuggets, more-or-less clean fine gold, and heavy sands with some gold.

Nuggets

Nuggets that are not held for personal use are usually sold privately to jewelry manufacturers or to individuals at a negotiated price. The price depends on size, shape, impurities, and most importantly, supply and demand. Since nuggets which are completely or partially covered with amalgam have little if any value for jewelry, most placer miners do not use mercury in their clean-up until the nuggets have been removed.

Placer fines

In the Yukon all gold exported from the Territory is subject to a royalty of 2½% based on the weight of the raw gold as shipped and valued at Can. $15.00 per troy ounce. When gold was selling at $20.67 per fine ounce the royalty was significant and even at $35.00 per ounce it was usually considered to be important. As a result, most miners carefully screened, panned and repanned, and finally handpicked and "blew" the clean-up. Usually the miner's wife had this job and most became very skillful.

With gold at much higher prices, the royalty is a very small percentage of the total value of the clean-up and it can be argued that it does not pay to spend much time or money on cleaning fines. In spite of this, many miners have continued the practice. Miners with larger operations are often inclined to ship dirty concentrate assuming that they will be paid for all the gold in it, and that the loss in paying royalty on heavy sand is more than made up by the saving in labour. This, however, is not strictly true.

First, refining charges are higher for dirty placer fines than clean fines. Second, refiners have a lower limit of acceptable gold content in the concentrate. Third, if the gold is dirty, the slag losses will be higher when the refiner pours the crude bar (miners bar) than if the gold is quite clean. The miner may or may not be credited for the slag loss depending on the practice of the refiner. Often there is no way for the miner to find out what the slag loss actually is. It can be significant. Finally, if the gold is very dirty (much more dirt than gold) the refiner may produce a higher grade concentrate by tabling or some other method and then pour the bar. There will be a charge (direct or indirect) for this service.

Many miners avoid these problems by amalgamating their clean-up after removing the nuggets. Another alternative to shipping placer fines to the refinery is for the miner to melt his gold and pour his own bar. This has certain advantages.

1) The miner can weigh and sample his bar before shipping and will know the amount of fine gold that he shipped within quite close limits. This is discussed in more detail later.

2) A bar with the miner's marks on it is easier to identify in case of loss.

3) There is less risk of loss by someone helping himself to some of the gold before melting. Most refiners, however, refuse to do anything with a gold shipment without the approval of the shipper if there is significant difference between the weight reportedly shipped and the weight received.

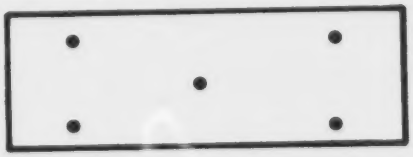
There are, however, certain disadvantages.

1) The miner requires a melting furnace and experience in operating it. He also needs flux material which is somewhat expensive.

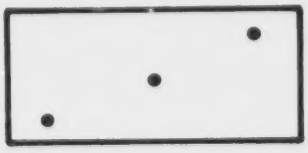
2) The slag losses are probably higher than at the refinery. The miner has to save his slag and either reprocess it himself or send it to a refinery for reprocessing.

If the miner decides to pour his own bars they may be sampled before shipping. The recommended patterns for drill holes are illustrated below. The drill cuttings should be weighed and sent to a certified assay laboratory that regularly does bullion assays to determine the fineness. The miner should specify that the gold must be returned after the fineness assay, otherwise it may not be.

Large Bars (more than 5 cm by 15 cm)

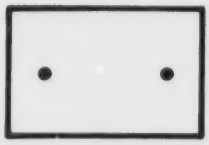


Medium Bars (about 5 cm by 15 cm)



Yukon Placer Mining, 1978-82, p. 50-53

Small Bars (less than 5 cm by 15 cm)



Alternatively, the miner may wait for the refiner to sample the bar. If this is done he should be present, or have a representative present, at the weighing and drilling of the bar and splitting of the cuttings.

Some refiners take a dip sample from the melt. The dip sample is poured into small, thin molds to yield gold pins and the pins are then assayed. If the melt is well mixed as in an induction furnace, this method is probably as good if not better than drilling the bars. Certainly it is a simpler procedure.

The miner or his representative will receive a split of the drill cuttings or the pins which he then delivers to his assayer. A third portion is held for an umpire assay if the refiner's and miner's assay do not agree within specified limits called the "splitting limits". The settlement is made by a prearranged method based on the assays.

Some placer miners may think that this is unnecessary but it is worth noting that most large mining companies always have a representative present during the sampling and obtain a split of the sample for their own assay. Incorrect assays have been known to occur and the procedure outlined above is the miner's only protection.

If the miner has been in the habit of cleaning his gold very carefully he may find that the fineness is lower if it is not so well cleaned. This does not necessarily mean higher gold loss. In some cases the reason for this is that the extra heavy sand contained silver and/or lead (or other base metals) that ended up in the bar. The amount of gold is the same but there is extra silver or base metals.

If a miner pours his own bar, he should be aware that there may be slag in it. This is caused by using an incorrect flux or too low a melting temperature. The technical details of melting and pouring bars is beyond the scope of this paper.

Heavy sands

Heavy Sands are commonly referred to as "black sands" although they may be mostly grey or brown. They contain a variety of magnetic and non-magnetic iron and titanium minerals, may contain tin or tungsten minerals, other heavy minerals, and some gold. Many miners have had these heavy sands assayed and found that they contained as much as 10 to 40 oz. per ton or more of gold. They realize that they cannot recover this gold by the methods they are now using and are therefore often interested in selling it to a smelter or refinery for recovery of the gold. Alternatively they may be interested in some piece of equipment that they can use to concentrate the gold in a higher grade concentrate.

Before deciding what to do with the heavy sands it is essential to know how much gold is in it, what size the gold is, and whether it is free or locked in particles of quartz or other minerals.

Sampling of this type of material is probably one of the most difficult of all sampling jobs. For example, let us assume that the miner has several tons of heavy sand which contains 40 oz. of gold per ton. The gold is all in small flakes (95% less than 0.9 mgm in weight or 0.38 mm (40 mesh) in size) and the raw gold is 800 fine. If the miner is willing to accept an accuracy of 0.5 oz. per ton two times out of three he will have to take an accurately split sample of 66 lbs. and send it to a laboratory for assay. If the assayer took ten 1-assay ton lots (28 grams each) from this sample and averaged the results the final result would be accurate to only 5 oz. two times out of three.

Few miners would be happy with this sort of an answer. If the miner decides to sell these heavy sands 'as is' to a smelter or precious metal refinery, it is recommended that he be present or have a representative present during the sampling and obtain a split of the final sample for assay.

Smelters are well aware of the serious problems of sampling this type of material. Since they would not be in business long if they paid for more metal than they received, the smelters protect themselves by paying for only a certain percentage of the contained gold and silver based on the assay. Some smelters have other protective devices built into their buying agreement.

Before deciding to ship the heavy sands to a smelter, (most precious metal refiners will not accept this type of material), the miner should determine how much of the contained gold is free and can be recovered by sophisticated gravity methods. This is best determined by an experienced, well-equipped laboratory. After removing all the gold possible, the remaining heavy sands should be examined for sand grains which contain visible gold that could be liberated by grinding. If this type of gold-bearing particle is found, probably the next step would be to grind and reconcentrate by gravity methods. The final heavy sand tailings should then be assayed. With all the laboratory information, the miner can decide how much he can improve his recovery himself and what product should be shipped to a smelter or precious metal refinery.

Refiners

There is a surprisingly large number of precious metal refiners in the world and there is no reason why the miner could not ship to almost any one of them. The selection should be made after investigating the terms and conditions in their refining agreements. Contracts offered by the refiner for acceptance by the miner should be carefully scrutinized and compared with agreements from the same company for casual shipments and with the contracts and agreements of other refiners. The differences can be almost unbelievable!

Refiners' agreements are often difficult to compare and it is not always easy to determine which is the best refiner to deal with. To assist in the determination, a check-list appears below. Some refiners may be rejected because they do not provide services that the miner considers necessary or desirable such as prompt payment,

cash advances, local representatives, etc. Some refiners will buy the refined gold, others will toll refine only (refine and return the gold to the buyer on payment of charges), and some will do both.

Once the miner has decided on a number of acceptable refiners he must decide which one offers the best return. The simplest way to do this is to assume a size of shipment and gold content that is about that of the usual shipment, send all the information to each of several refiners, and ask them to work through the calculations and show the resulting charges and returns. A sample shipment consisting of a 200 oz. miner's bar assaying 80% gold, 18% silver, and 2% base metals was proposed to five refiners. The returns from each follow.

Refiner	Net return in Can. $
A	$54,804.68
B	53,200.00
C	55,901.00
D	55,707.84
E	54,797.71

These are real numbers. The difference in net return is what the difference would actually be if the miner made one of five exactly equal shipments to each refiner. The paper work may not be appealing but it is worth it and furthermore it only has to be done once unless a refiner changes his schedule.

There are some other, less tangible, factors which must be considered. The miner should visit any refineries that he considers doing business with and ask lots of questions. If nothing else, he will have a more comfortable feeling about the refiner he has selected after he has compared the operations of the different companies.

Another vital factor is the likelihood of the refiner staying in business. It is difficult to imagine anything much worse than the refiners cheque not arriving or not being good when it does arrive. The history and "track record" of the refiner should be checked out thoroughly before making any shipments. A credit report by Dunn and Bradstreet or similar agency might not be amiss.

The miner should meet with the refiner before making any shipments to settle on place and method of delivery of the raw gold, the place and method of delivery of the refined gold or place and method of payment, and any other matters of mutual concern.

Once the miner has decided on a particular refiner, he should change refiners only after careful consideration. The good customer of long standing usually gets better treatment under unusual conditions such as a nation-wide or world-wide shortage of refinery capacity or other uncommon but potentially serious difficulties.

Check-list for comparing refining agreements

Services provided and charges for those services
- Pickup at mine site or in town
- Payment of royalty on behalf of the miner
- Packaging
- Shipping
- Insurance
- Marketing

Minimum acceptable gold content

Maximum acceptable silver content

Maximum and minimum acceptable weight

Amount of gold and silver paid for

Amount of platinum metals paid for (if any)

Provisions for miner's representative being present during weighing and sampling of shipment, and for umpire assaying

Deductions or penalties including those for the presence of unwanted compounds such as arsenic

Charges for melting, sampling and assaying, refining, packaging and delivery, etc.

Storage charges

Marketing
- Will the refiner market the bar or toll refine only
- Time from receipt of placer fines (or miner's bar) until refined bar(s) is/are available
- Time and method of fixing prices
- Service charges

Payments
- Time and method of payment of charges
- Time and method of payment for bullion

Are the refined bars "good delivery" on a commodity exchange or are they "merchantable bars" - and on what markets

A list of definitions of trade terms used in agreements.

Insurance

In spite of weird and wonderful stories of the past where gold bars were left on the station platform for the next train, every miner now is conscious of the risk of theft or loss. Once the gold has been recovered and weighed it can and should be insured. Insurance rates are low. A typical rate for unaccompanied shipments is 0.075% of the value of the shipment. Major insurance brokers handle this type of insurance under quite reasonable conditions. All insurance rates are not equal, however, and the miner should shop for terms and conditions.

Besides transportation insurance the miner can insure his credit risk (the risk that the metal merchant or refiner may not pay for the gold). Some refiners and metal merchants may be such good credit risks that insurance is probably not worth considering, but if the miner chooses to deal with a smaller or less well known refiner it may be wise to insure the credit risk. His insurance broker (not the local insurance agency) can arrange this type of insurance or advise him where it can be obtained. Generally claims against this type of insurance will be paid only after 90 days and there is a deductible clause similar to other types of insurance. Risks due to "force majeure" clauses in sales or refining contracts are, to the best of the author's knowledge, not insurable but it might be worth

asking. "Force majeure" clauses include delays due to strikes, riots, destruction of the plant by fire and other catastrophes beyond the merchants' or refiner's control.

One advantage of insuring the credit risk is that the insurer monitors the risk and if the metal merchant or refiner becomes a poor credit risk the insurer will advise the miner. This may be the first word the miner has that all is not well.

It is also worth noting at this point that the miner should place all of his insurance through one broker to avoid the possibility of overlapping insurance coverge or of "holes" in the coverage.

Selling

If the miner decides to hold some of his gold he should be aware of the fact that if he holds refined gold in bars he may have to have it reassayed before being able to sell it. There are a number of markets for refined gold, including the following ones.

1) The open market

2) Refiners

3) Metal Merchants
   - banks
   - independent metal merchants

4) The commodity exchanges

The open market is composed mainly of traders, hoarders, and fabricators. Their requirements will be quite specific as to size, shape and purity, and they will likely want to receive delivery directly from the refinery so that they can be sure they are getting exactly what they want. It takes a well developed marketing organization to sell on the open market. It is not the market for the ordinary primary producer.

Some refiners will buy the miner's gold for resale and pay him directly for it. This is probably the simplest way to sell gold. Some refiners such as the Canadian Mint do not, however, buy gold. The miner must go to a metal merchant (who may also be a refiner), or the banks or commodity exchanges to market his gold.

Metal merchants are brokers who collect a commission for selling gold. Sometimes the best terms can be arranged through metal merchants but the merchant should be scrutinized as carefully as the refiner. After all, they will have the miner's gold in their possession and are acting as his agent. A few of the Canadian chartered banks act as metal merchants because they will buy refined gold for their own account and for resale. Some Canadian banks will buy raw gold and arrange for refining and sale for a commission.

Commodity exchanges also buy and sell gold. Sales must be handled through a brokerage house that is a member of the commodity exchange. Sales can be made for 'nearby' (within a few days) or future delivery (some specified future date). The mechanics of selling on a commodity exchange are described in more detail in the paper on hedging in this volume.

It should be quite obvious that once a decision is made on the method of selling, detailed arrangements must be made with the insurance broker, the transportation company, the refiner, the bank, and the metal merchant or the commodity broker. Once the miner is recognized as a reputable person actually producing gold these arrangements can usually be made with a few short telephone calls.

HEDGING GOLD PRODUCTION

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Presented at the D.I.A.N.D. - K.P.M.A.
Placer Mining Short Course, Whitehorse, Yukon
April 20-22, 1982

Introduction

The placer miner had few problems marketing his gold until the mid-1970's when the price started to fluctuate dramatically. This fluctuation in price has placed many operators in a difficult position because their gravel may be pay today and waste next week. Hedging is a procedure that can be used to keep the operation profitable.

Hedging has been used in the metals trade for over 100 years to protect profits and limit loss. Many larger producers, fabricators and others who own metal for a period of time regularly hedge their position.

While this paper was written for the placer miner who is producing gold, the same principles apply to silver and to some other metals.

Principles of hedging

If the mine operator has decided that he can live with the present price of gold but could not risk a significantly lower price, he can enter into a firm contract to sell his gold at a price that is fixed today for delivery on some future date even if he has not yet mined the gold. This is called a price fix hedge. This is possible because fabricators who will be using the gold at the future date have already priced their product on the basis of today's price for gold and do not want to run the risk of paying a higher price when they need it. They will therefore enter into a contract for future delivery at a price that is fixed today.

The contract is for a specified amount of gold (usually multiples of 100 troy oz. although it is 400 oz. on the London Metal Exchange) of specified purity (usually 995 fine) and carrying the mark of a refiner recognized by the metal exchange on which the trade is executed.

The transaction is called a hedge. It is made through a broker who works for a brokerage house that is a member of the commodity exchange where the contract is executed between buyer and seller. For simplicity we will assume that the transaction is made at Commodity Exchange Incorporated (COMEX) in New York. The rules and procedures on the other American exchanges are very similar. The Hong Kong Exchange, The London Metal Exchange, and other European exchanges have very different rules and procedures. The miner may wish to investigate these other exchanges at his leisure, but they are generally not as convenient as the North American exchanges. There is very little gold traded on the Winnipeg exchange, indeed none on many days, and therefore Winnipeg should not be considered.

Hedging Procedure

The exact procedure is illustrated in the following example.

1) Today is July 15th. A miner expects to have 100 oz. of refined gold ready for sale by early October. He calls his commodity broker and learns the following.

   - The latest trade in gold on COMEX is US $330.00 per troy ounce for July delivery (this is referred to in the trade as "spot" or immediate delivery).

   - The latest trade in gold for October delivery is US $350.00. The difference in price ($20.00) is known as carrying charge. This is approximately equal to the cost of storing, insuring, and financing an ounce of gold until October. The buyer really has a choice of buying the gold now and paying these charges or entering into a contract for October delivery at a higher price. Markets being what they are, there is usually only a small difference for the buyer. This is not always true for a number of reasons that are beyond the scope of this paper.

2) The miner considers that $350.00 per ounce will cover his costs and show an acceptable profit. On the other hand if gold should be selling at $290.00 in October, he would not be able to cover his cost. He also realizes that if he "sells forward" for October delivery and the price goes up he will get only the agreed-on price of $350.00. He decides to sacrifice the possibility of a higher price for a guaranteed locked-in profit.

3) Assuming that the miner wants to fix his selling price for 100 oz. of gold for October delivery, he instructs his account executive (popularly called a broker) to "sell one October gold at 350". The account executive places the order through a closed circuit teletype to his office at the exchange. Their broker (popularly called a floor trader) calls out on the floor his offer of "one October gold at 350". Another broker who has an order to buy at the same price identifies himself, and the agreement is made. The transaction is recorded, the account executive is notified, and he in turn notifies the miner by phone and by written confirmation. If the miner wishes, he can wait until his order is filled or if it is not, adjust his price until it is. Or, alternatively, he can place a "market order" and take what he gets. Often the price is almost as good as if the order is placed at a fixed price. The advice of the broker is usually helpful.

4) The miner recovers the gold from his operation in September and delivers it to a refiner who is recognized by the exchange on which the

Yukon Placer Mining, 1978-82, p. 54-57

forward sale has been made. The refiner is instructed to refine the gold and pour a 100 oz. "good delivery" bar and deliver it to a vault in New York approved by the exchange for the miner's account. The vault issues a warehouse receipt which is delivered to the broker in New York.

5) The miner then, through his broker, gives notice to the exchange that he will make delivery on the third business day following.

6) On the third day the miner's broker delivers the warehouse receipt on payment of the full amount of the contract ($350 x 100 oz. = $35,000) in cash.

7) The money is transferred to the miner's account, the margin money is reimbursed, and the transaction is completed. The miner sold his gold at $350.00/oz. and was paid $35,000 for 100 oz. regardless of what gold was selling for in October. There is virtually no risk on the part of the miner. The exchange is owned and operated by the member brokers and they are required by law to maintain adequate reserves with the exchange.

Certain arrangements must be made with the broker before any transaction may occur. An account must be opened. The "brokerage house" for whom the broker works has its own rules requiring evidence that the customer (in this case the miner) has adequate financial resources and is indeed part of the "trade" i.e. is actually in the business of mining and producing gold and will in all likelihood be able to deliver 100 oz. of gold in October. The miner will have to deposit money with the brokerage house when the account is opened to cover the cost of executing the transaction (brokerage) and earnest money on the contract (margin) as required by the exchange. Margin requirements vary from time to time without notice depending on how volatile the markets are. Recent margin requirements have been $1,500 to $2,000 per contract of 100 oz. Speculative margins are considerably higher.

Advantages and disadvantages of hedging

There are other advantages besides the obvious one of a guaranteed profit for the operation.

1) The miner's banker is very happy because the miner has a locked-in profit and will therefore have no difficulty in meeting any loan payments coming due. The miner is obviously a good credit risk.

2) The miner's accountant is also very pleased because he can generate much more accurate financial forecasts and will be able to state the financial position of the operation with more certainty.

The only real disadvantage is that if the price of gold goes up dramatically, the person who made the decision to hedge will not only have to forget about the profit he might have made, but if he has to answer to other shareholders he will probably find some who will tell him he made a bad decision. They would likely be the same ones who would complain the loudest if the price dropped and the mine operator was not hedged. The fact that there was a satisfactory profit may be forgotten.

Margin calls

If the price of gold falls steadily until delivery day, the margin originally posted is more than adequate. If, however, the price should rise significantly, the miner has a temporary paper loss on the transaction and the broker will issue a "margin call" requesting a further cash deposit. This must normally be settled within a matter of hours or the broker is obliged to close out the hedge transaction. Since the miner may not be available to meet the margin call on short notice, he should make arrangements with his banker before entering into the hedge transaction. Once the banker is satisfied that he is adequately protected, the margin calls are then delivered to the banker who loans the money to the miner and meets the margin call on his behalf. If later on the price drops, the margin can be reduced, and the loan paid off. In any event, all the margin is refunded when the hedge transaction is completed. All that it has cost the miner is interest on the margin money, and of course the brokerage charges for the transaction.

Closing a hedge without delivery

It should be fairly obvious that if the cash price for gold (sales for cash on immediate delivery) declines, the futures price will also decline and conversely they will rise together. The difference is normally, but not always, fairly close to the carrying charges (storage, insurance and interest). Furthermore, the cash price will be very close to the futures price as the delivery month is approached.

Let us now suppose that the mining operation has gone better than expected and the gold is ready for delivery in mid-September. If the miner makes delivery on his October contract, he will have to wait about two or three weeks before he gets paid. On the other hand, he can buy back his October contract at the 15th September price for October gold, and sell the gold through his refiner or directly through his bank. If, for example, October gold is selling at $310.00 and spot gold is selling at $305.00, the miner sells the bar at $305.00, and shows a profit of $40.00 ($350 - 310) per ounce on the futures transaction. The miner effectively receives $345.00 for his gold. On the other hand he saves the cost of transportation, insurance, and incidental costs on the delivery. He will also receive payment three weeks sooner.

If the price has gone up there would be a loss on the futures transaction which should almost balance the gain on the cash sale of the gold. The miner, therefore, effectively receives what he expected for his gold, i.e. $350, minus a few dollars. This few dollar loss and his brokerage costs can be considered as the cost of "price insurance". Occasionally he will break even on the transaction or even make a few dollars but in any case the amount is usually small.

Most hedge transactions are closed out this way rather than making delivery. No delivery arrangements have to be made and settlement is faster. Furthermore the brokers do not greet the idea of delivery with any enthusiasm because it means more work for them with little or no return.

Put options

An alternative to direct hedging as described above is to buy a 'put' option. This is a relatively new device which is becoming very popular. Put options are obtained through commodity brokerage houses and the miner who decides to investigate options should obtain all details from his broker. The following examples illustrate the outcome in both a rising and falling market.

1) The miner buys a 'put' or an option to sell an October futures contract for $350.00.

2) He pays, say, $20.00/oz. for this option plus brokerage charges.

3) If, when he sells his gold in October the cash price is $300.00, he can exercise his option at $350.00 and deliver his gold against the October futures contract as before. He will receive $350.00 less the $20.00 the option cost him less the brokerage charges or a net of a little less than $330.00 per ounce.

   A second alternative is to sell the gold before the expiry of the option in October and simultaneously sell his put for a profit with very nearly the same net effective selling price for the gold.

4) If the price of gold moves to, say, $400.00 the miner would not exercise the option but would sell his gold on the open market. He would net a little less than $380.00 for his gold ($400.00 less the cost of the option of $20.00 and brokerage charges).

Effectively, the miner has fixed a minimum price of approximately $330.00 and a maximum price of $20.00 less than the market in October. There will be no margin calls and he can obtain some of the benefits of any price increase. The cost of the option and the brokerage charges are known before hand and can be considered as 'price insurance'.

How much to hedge

Another point which should be mentioned is the question of how much of the gold should be hedged. This depends on the market (whether rising or falling), the risk of interruptions in production, the cost of money for margin requirements, or the cost of put options, and, of course the effect on the mining operation of a declining price for gold. If the monthly production is more than two contracts (200 oz.) only part of the production could be hedged. It should be noted that any production in excess of 100 oz. and less than 200 oz. would remain unhedged on COMEX, although the Mid-American Exchange handles 33 oz. contracts. The Mid-American exchange is not popular with many brokers, however, because of poorer communications facilities.

Speculators

The only real justification for the commodity market is the trade hedger, but the market could not function properly without the speculator.

The short hedger (the miner) must be able to find a buyer when he is ready to sell. If there is no long hedger available at the moment the price could be driven down unreasonably low until a buyer is found. The reverse would occur when the long hedger enters the market but there is no short hedger. In an active market, however, there are always speculators available. Much of the speculative trading is done by the general public but besides the speculating public, the floor traders are active on their own account. They trade on very small commissions and usually close their trades out on the same day. For these reasons, they are satisfied with a modest profit from very small price changes. Their trading during the day stabilizes the market because they will buy or sell any time they feel the market is "out of line". An instant market for the hedge transaction is reasonably assured. The speculating public of course also make their contribution to the market activity. Anyone who owns unhedged gold is in fact speculating on the price, even if he is still in the process of mining it.

Psychological pitfalls

The greatest problems in hedging commodities are the emotions of the trader. From the author's experience the major pitfalls are the following:

1) Becoming too absorbed in the market. Many people become fascinated with the market and it becomes an absorbing passion. The hedge trader should treat the commodity market as he would his insurance program - informed, critical, unemotional, and justifying only a certain amount of time.

2) Mixing up hedging and speculating. After successfully predicting a few moves in the market the hedger is strongly tempted to speculate. Some companies in the trade have speculated very successfully - in part because of their intimate knowledge of the market. On the other hand, many hedgers have mixed up hedging and speculating and made disastrous speculative mistakes. Considerable experience and absolute control of the emotions is essential for successful speculating. The author does not recommend speculating. In view of these psychological hazards the author recommends that the hedger give careful thought to setting up his hedging organization to minimize these risks. The exact organization will depend on the general organization of the business and the temperaments of the key people. If the hedging program is treated as objectively and unemotionally as the insurance program there should be few problems.

Selecting a broker

The reader has probably realized that selecting a suitable broker is an essential first step in any hedging program.

1) He should be a commodity specialist working for a large brokerage house that deals exclusively in commodities or has a commodity division with complete technical backup. The

house should be a member of the commodity exchanges and have their own research department. The ordinary stock broker does not understand the commodity markets, let alone hedging.

2) The broker should be experienced in hedge transactions in metals. A broker who deals only with speculators probably lacks the knowledge to assist in planning an effective hedging program. A broker who deals only in hedge transactions in agricultural commodities may not appreciate the subtleties of the metals trade. Do not be afraid to question him closely on his experience.

3) He should be willing to spend time explaining commodity trading in the afternoon after the markets are closed. It is an imposition to expect him to spend time explaining something if he is busy placing orders.

4) He should be a person who inspires your confidence. It is said that business is a confidence game: no confidence - no business.

There are numerous subtleties in hedging which are beyond the scope of this paper, such as selecting the best delivery month and the best market in which to place the hedge. These should be discussed with the broker.

Refiners

One other thing that has been passed over rather lightly is the matter of the refiner. If there is any possibility of making delivery of the bars, the refiner's bars must be recognized by the exchange. The purity of the bars or the reputation of the refiner do not in themselves guarantee "good delivery". A bar may be "good delivery" on one market but not on others and it may be a "marketable" bar (accepted on the cash market) but may not be "good delivery" on a particular exchange. Either a particular refiner's bars are good delivery or they are not.

Furthermore, there is a considerable difference in the services offered by the various refiners. These should be investigated in detail when decisions are being made on the marketing strategy. The Canadian Mint bars for example are good delivery on COMEX but the Mint offers virtually no service after refining. The bars must be picked up at their counter in Ottawa by the miner or his agent. Finally, the refiner should be advised in advance of whatever selling arrangements you decide to use so that he can give you the service for which you are paying.

Conclusions

Hedging is a very powerful method of limiting or preventing loss resulting from declining metal prices. Successful hedging, however, requires knowledge, self-control, a knowledgeable broker, and prior arrangements with the refiner, banker, and in some cases, the transportation company and insurance agent.

PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983

AND

DESCRIPTIONS OF PLACER MINING OPERATIONS ACTIVE BETWEEN 1978 AND 1982

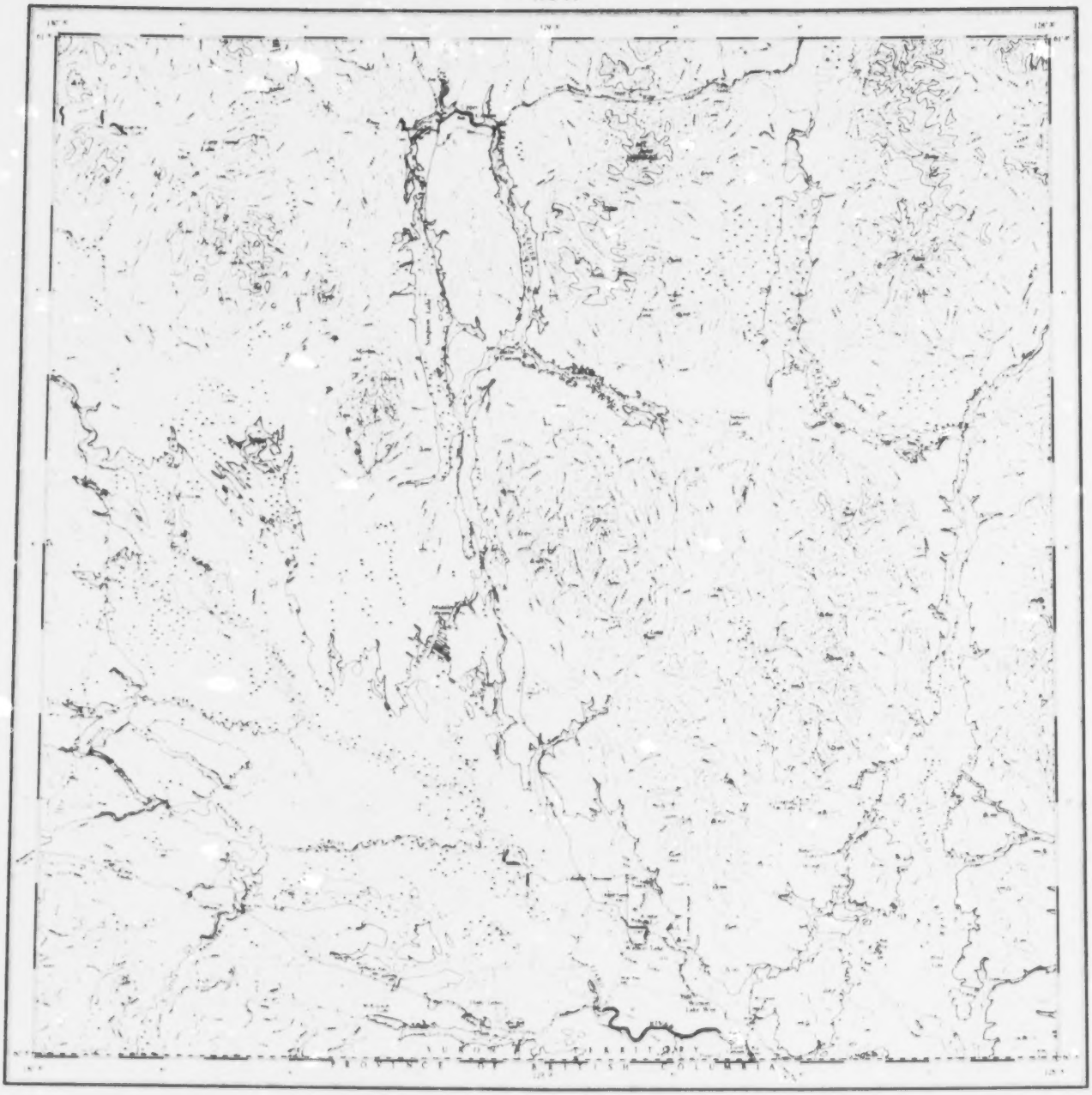
Reports in this section describe

between 1978 and 1982. Information in the reports was derived from field investigations of R.L. Debicki, and from records on file at D.I.A.N.D. in Whitehorse. Some information for the years 1978 and 1979 was compiled from the field notes of Dr. D.B. Craig. Each report is keyed to a set of maps which are reductions of the 1:250,000 scale topographic maps. The maps show the distribution of placer claims and leases, as well as the location of each mining operation. Due to the density of mining operations in the Klondike area, a separate map, with less reduction than the others was prepared for that area. The claim information on the maps was compiled from the maps of the Supervising Mining Recorder, D.I.A.N.D., Whitehorse, Yukon

The maps are arranged according to the National Topographic System alphanumeric sequence. Map areas not shaded on the following index map did not have placer claims or leases in good standing on January 1, 1983. They also did not have any active placer mining operations during the period 1978 to 1982. Accordingly, they are not included in this volume. Some of the shaded map areas had placer claims or leases in good standing as of January 1, 1983, but did not have any active placer mining operations between 1978 and 1982. Others, which had active mining operations have numbered dots indicating the locations of the workings. Each of those maps precedes a section describing placer mining activity within that area. Each report on a property includes a heading with a number keying it to the map, the National Topographic System reference number indicating the 1:50,000 scale map area in which it lies, and its latitude and longitude. The name or names in the heading are those of operators at the site during the time covered by the report, while the years indicate which years during the period 1978 to 1982 there was work done. There are undoubtedly omissions. Some operations where the work done was exploratory or preparatory were omitted on purpose. Other operations where exploratory or preparatory work was done were included because of the large scale of the work. Data was unavailable for some mining operations, and incomplete for others.

INDEX of N.T.S. MAP AREAS in REPORT

105 A



HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983

WATSON LAKE

YUKON TERRITORY

5 0 5 10 15 20 25 30

KILOMETRES

105 B

HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983.

WOLF LAKE

YUKON TERRITORY

5 0 5 10 15 20 25 30

KILOMETRES

105 C

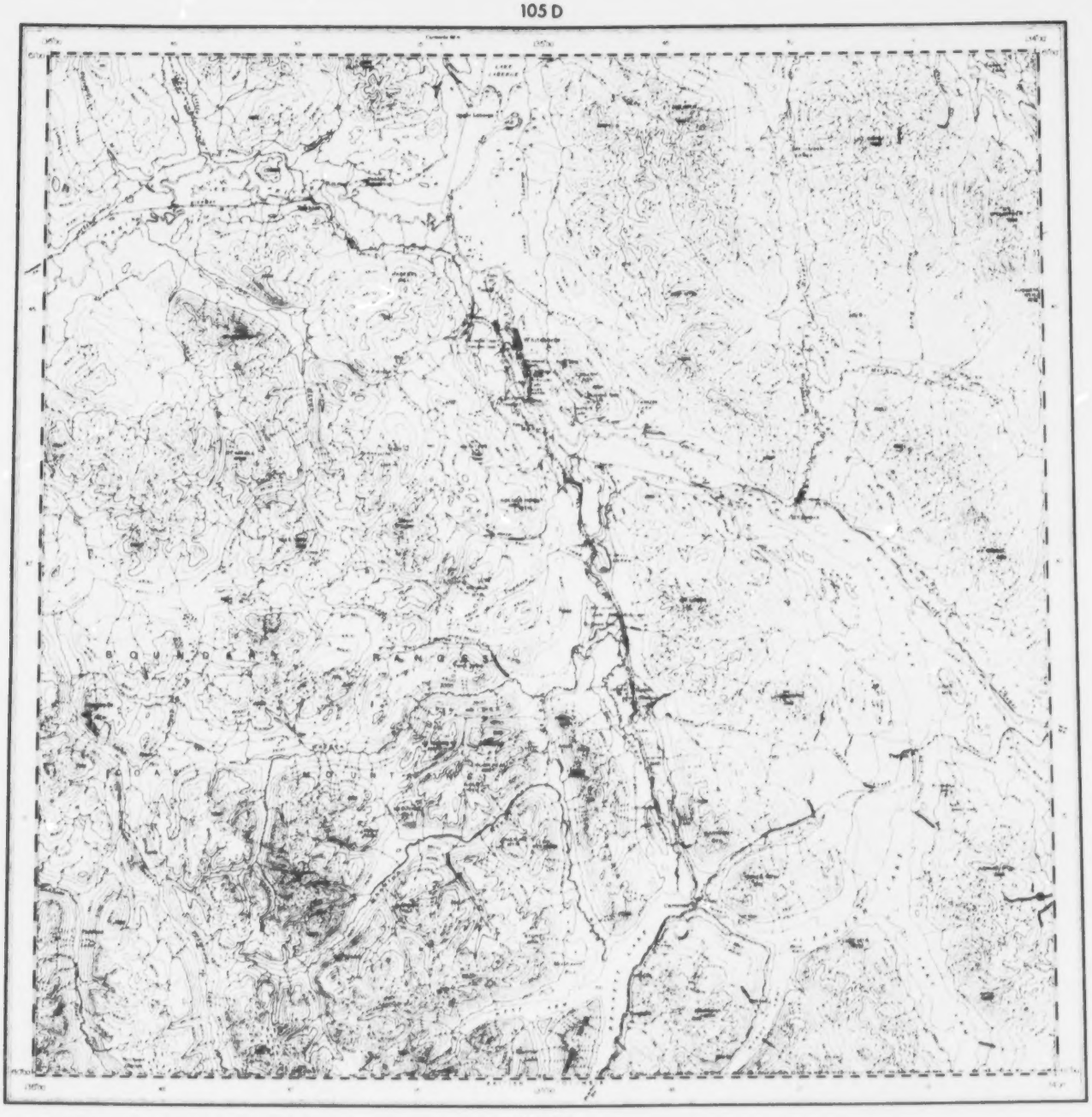
HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983.

TESLIN
YUKON TERRITORY

5 0 5 10 15 20 25 30
KILOMETRES

NOTES

105 D



HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983.
DOTS INDICATE PLACER MINING OPERATIONS ACTIVE DURING THE PERIOD 1978 TO 1982. NUMBERS BESIDE THE DOTS RELATE TO THE TEXT

MAP OF YT

WHITEHORSE

YUKON TERRITORY

5 0 5 10 15 20 25 30

KILOMETRES

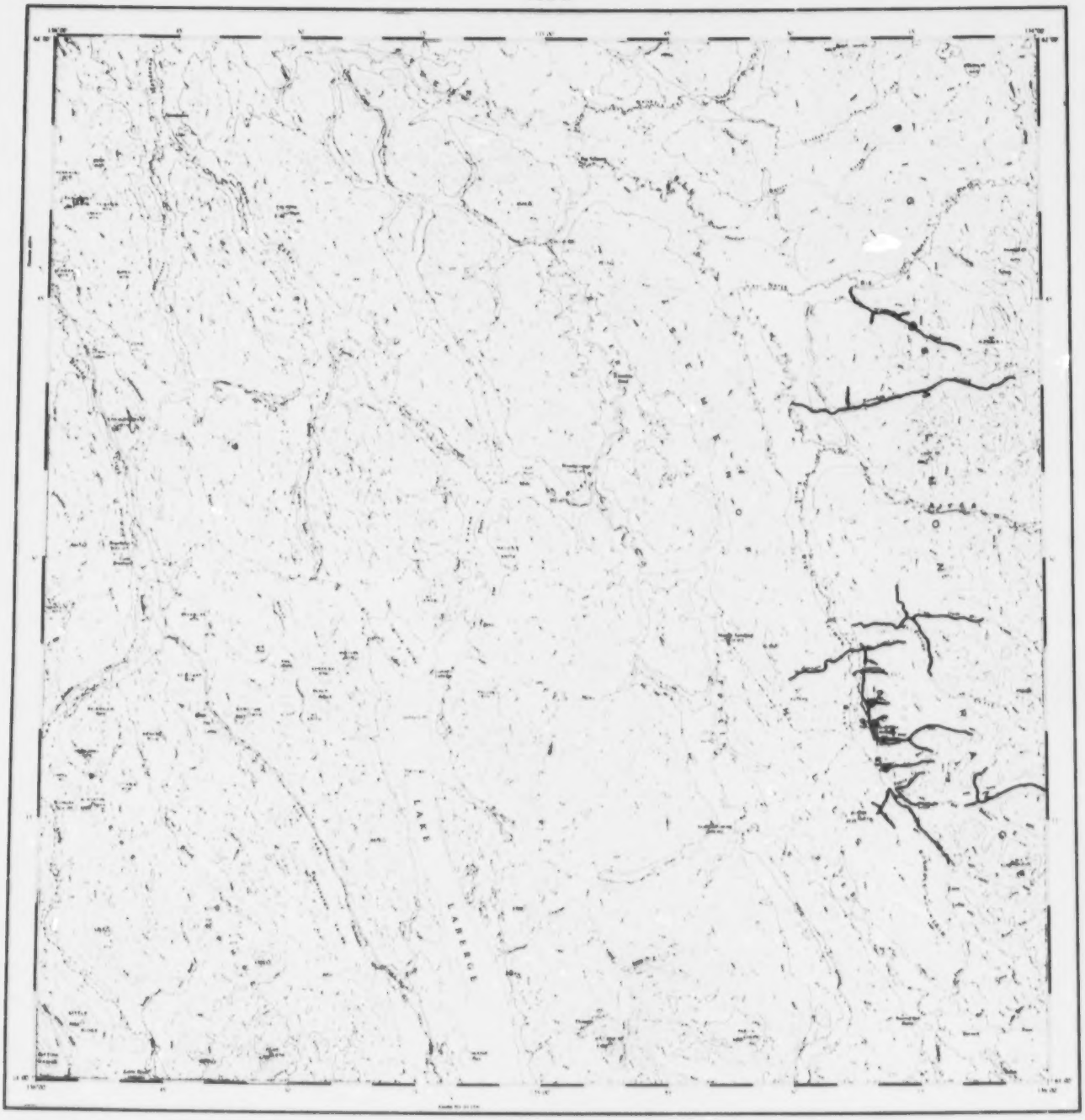
PLACER MINING OPERATIONS IN THE WHITEHORSE MAP AREA, NTS 105 D

Helfrich Pipeliners (1)
Moose Creek 105 D 1
1982 60° 10'N, 134° 02'W

This property is situated on Moose Creek west of Little Atlin Lake and southeast of Jubilee Mountain. Deposits at the site consist of 2 metres (6 feet) of black muck overlying 3 metres (10 feet) of gravel.

Test work was done along the right limit of the creek in 1982. A Massey 400 bulldozer, and a P & H backhoe with .9 cubic metre (1.25 cubic yard) bucket were used for mining, and a 9 metre (30 feet) long sluice box was used for processing. The results of the work were disappointing. In addition, water for sluicing was not readily available because the creek dried up during the summer.

105 E



HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983. DOTS INDICATE PLACER MINING OPERATIONS ACTIVE DURING THE PERIOD 1976 TO 1982. NUMBERS BESIDE THE DOTS RELATE TO THE TEXT.

LABERGE

YUKON TERRITORY

5 0 5 10 15 20 25 30

KILOMETRES

PLACER MINING OPERATIONS IN THE LABERGE MAP AREA, NTS 105 E

Triple E Mining
D'Abbadie Creek
1982

(1)
105 E 9
61° 44'N, 134° 16'W

This property is situated along the middle portion of D'Abbadie Creek, approximately 10 km (6.2 miles) above its confluence with the North Big Salmon River.

Two people worked with a D8 bulldozer and a backhoe at the property in 1982. Stripping of overburden was done with the bulldozer, while the backhoe was used for digging test holes.

G. Asuchak
Lake Creek
1978, 1979, 1980
1981, 1982

(2)
105 E 8
61° 22'N, 134° 21'W

This property is situated on Lake Creek approximately .3 km (.2 miles) above the small lake at the confluence of Luke and Summit Creeks. The first 200 metres (650 feet) of Lake Creek above the lake have a shallow gradient. The creek then enters a canyon with 15% gradient. Mining is done in the canyon. Deposits in the area consist of 0 to 3 metres (10 to 20 feet) of gravel. Very large boulders are common in the gravel.

Work at the site in 1978 consisted of mining and sluicing approximately 3,750 cubic metres (5,000 cubic yards) of gravel. In 1979, only test work was done. An HD-5 loader, and a Case 450 backhoe were used to mine in 1980. Approximately 1,750 cubic metres (2,300 cubic yards) of material were sluiced through a sluice box 60 cm (24 inches) wide and 6 metres (20 feet) long. Work continued in 1981, and 1982 when two people mined at the site. Problems with low water levels in the creek restricted sluicing during parts of the summer.

Gold from Lake Creek is reported to have a fineness of 895.

R. Asuchak
Summit Creek
1980, 1981, 1982

(3)
105 E 8
61° 21'N, 134° 20'W

This property is situated near the downstream end of the east-west trending portion of Summit Creek. Placer deposits in the east-west trending portions of this and other creeks in the Livingstone Creek area survived glaciation because their orientation was perpendicular to the direction of flow of the ice in the South Big Salmon River Valley. Deposits in the part of Summit Creek being mined are approximately 2.5 metres (8 feet) thick, and consist of tailings from mining operations active in the 1930's.

Test work was done on the property in 1978. A D4 bulldozer, and an HD-5 loader with .75 cubic metre (1 cubic yard) bucket were used to mine in 1980. A 60 cm (24 inch) wide sluice box 8 metres (27 feet) long was set in the creek bed, and gravel and water were pushed into the sluice box by the bulldozer. The D4 bulldozer and an HD-6 loader were used to mine in 1981. Three dams were constructed to impound water, as low water levels in Summit Creek during parts of the summer restrict sluicing. Work continued at the property in 1982.

M. Fuerstner
Livingstone Creek
1978, 1979, 1980
1981, 1982

(4)
105 E 8
61° 20'N, 134° 19'W

This property is situated on Livingstone Creek, at the downstream end of the east-west trending portion of the creek.

Mr. Fuerstner and one helper worked on the property each season from 1978 to 1982. They mined using a D7 bulldozer, and a loader.

Gold from Livingstone Creek is reported to have a fineness of 880.

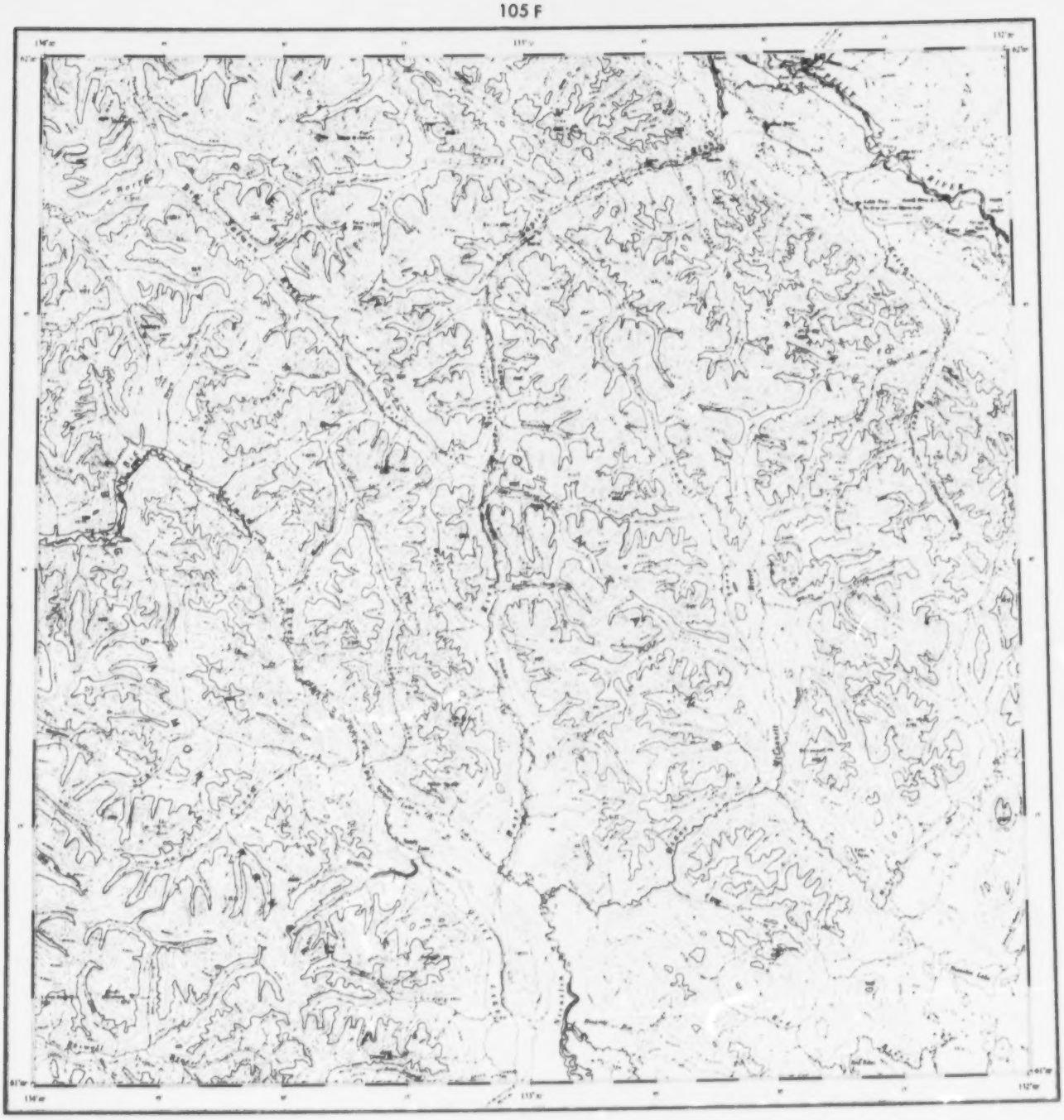
D. Gonder
Martin Creek
1980, 1981, 1982

(5)
105 E 8
61° 18'N, 134° 19'W

This property is situated in the narrow, confined valley of Martin Creek, approximately .5 km (.3 miles) from its confluence with South Big Salmon River. Gravel deposits in the area contain many very large boulders.

Work at this property was carried out in 1980, 1981, and 1982 by two people using a D7 bulldozer, backhoe, and single channel sluice box.

105 F



HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1963.

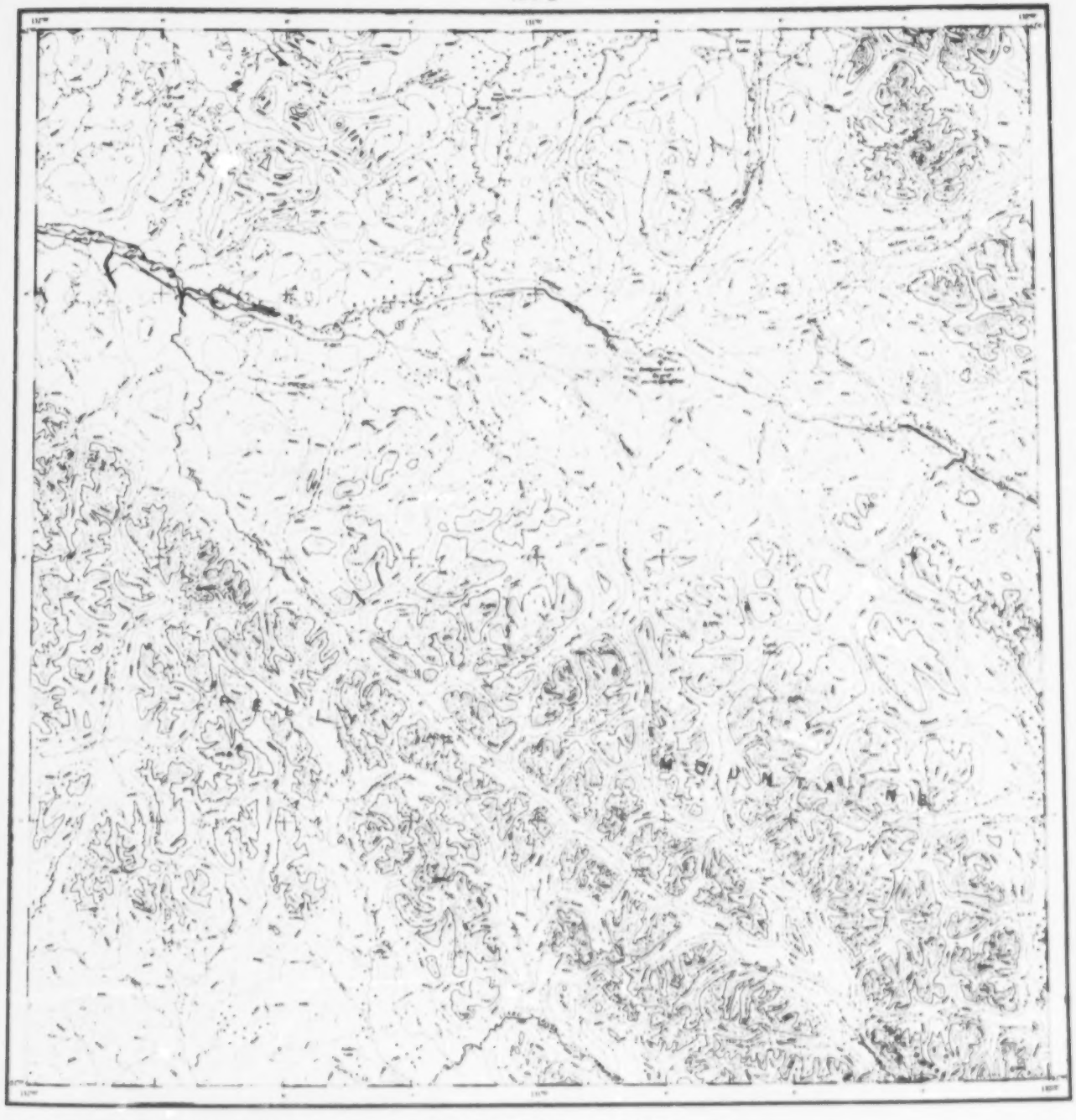
QUIET LAKE

YUKON TERRITORY

5 0 5 10 15 20 25 30

KILOMETRES

105 G



HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983.

FINLAYSON LAKE

YUKON TERRITORY

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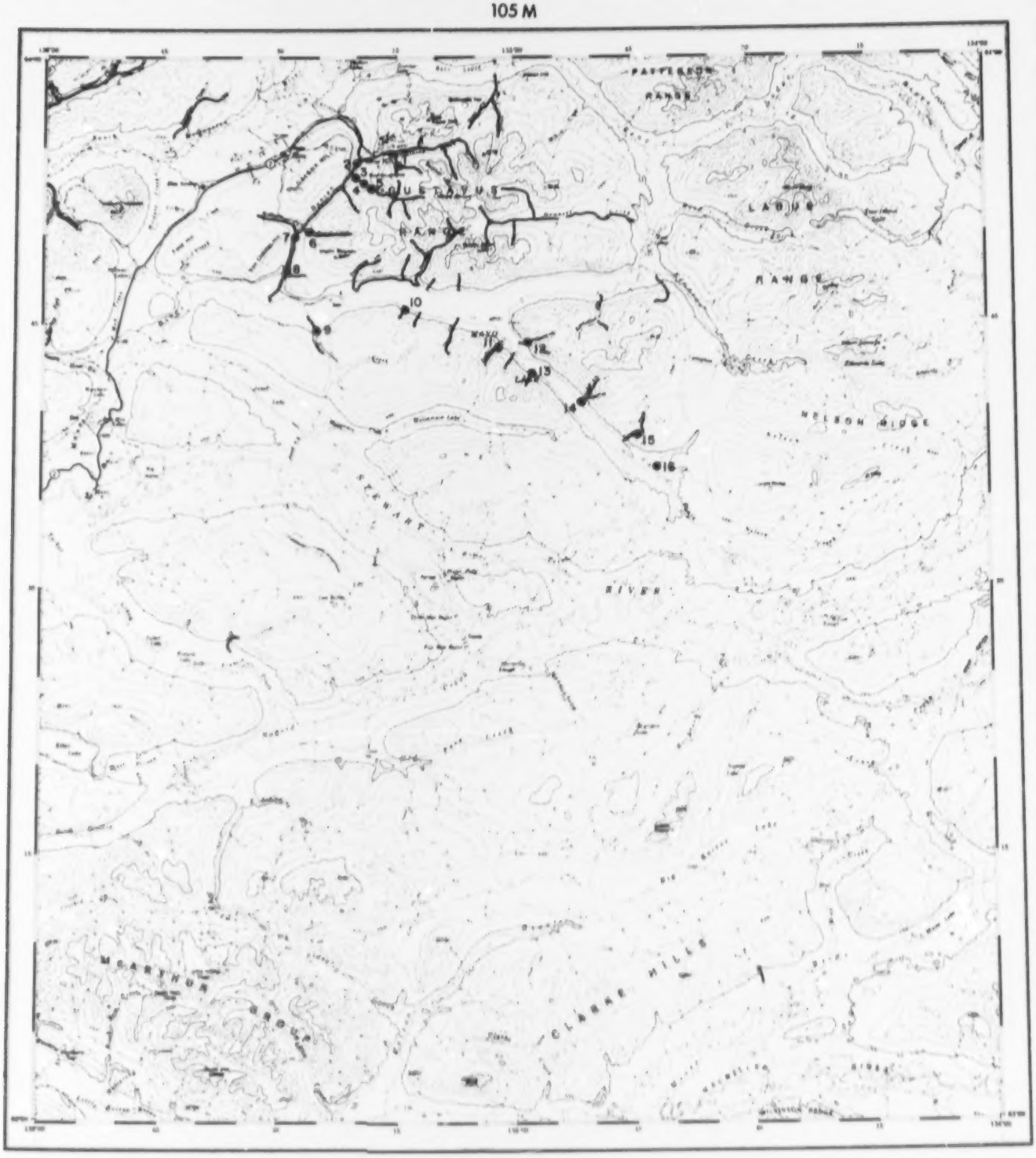
KILOMETRES

105 M



HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983.
DOTS INDICATE PLACER MINING OPERATIONS ACTIVE DURING THE PERIOD 1976 TO 1982. NUMBERS BESIDE THE DOTS RELATE TO THE TEXT

MAYO
YUKON TERRITORY

5 0 5 10 15 20 25 30
KILOMETRES

PLACER MINING OPERATIONS IN THE MAYO MAP AREA, NTS 105 M

Bardusan Placers Ltd. (1)
Thunder Gulch 105 M 14
1978, 1979 63° 54'N, 135° 15'W

This property is situated approximately 3.2 km (3 miles) east of Keno City on Thunder Gulch, a left limit tributary of Lightning Creek. Deposits at the site are up to 16 metres (52 feet) thick, and consist of up to 10 metres (32 feet) of glacial till overlying 6 metres (20 feet) of pre-glacial creek gravel. The present creek valley is very narrow, and the gradient of the valley is very steep. Large boulders are common.

Three people worked on the property in 1978 and 1979, using a D7 bulldozer, and a loader with 2.3 cubic metre (3 cubic yard) bucket. They mined approximately 15,000 cubic metres (20,000 cubic yards) of material from a cut 15 metres (50 feet) wide and 90 metres (300 feet) long each year. Tailings were stacked up the valley wall due to lack of space in the valley bottom.

Gold from Thunder Gulch is reported to have a fineness of 790 to 825. The largest nugget recovered from the creek was reported to weigh 220 grams (7 ounces). Argentiferous galena derived from nearby lode silver-lead deposits is also present in the gravels of the creek.

A. Hofer (2)
J. Willies 105 M 14
F. Tveter 64° 54'N, 135° 19'W
B. Foot
Lightning Creek
1978, 1979, 1980
1981, 1982

This property is situated on Lightning Creek at, and immediately downstream from Keno City. The creek flows through a wide, shallow canyon in this area.

Numerous miners worked on the property between 1978 and 1982, especially on weekends. A. Hofer worked in 1978, and 1979. J. Willies took over Mr. Hofer's workings in 1980, and mined using a D6 bulldozer, and backhoe. F. Tveter was active just upstream from him. Only a limited amount of representation work was done in 1981. B. Foot worked by hand in 1982, and used a small sluice box set in the bed of Lightning Creek.

Gold from Lightning Creek is reported to have a fineness of 830.

N. Bunka (3)
C. French 105 M 14
Duncan Creek 63° 53'N, 135° 21'W
1980, 1981, 1982

This property is situated on Duncan Creek, immediately above its confluence with Lightning Creek. Deposits at this location are of glaciofluvial gravel with boulders up to 60 cm (24 inches) in diameter, but more commonly 20 cm (8 inches) in diameter.

Work on the property was begun in 1980 by N. Bunka, who mined several small test cuts totalling 560 square metres (6,000 square feet) in area using a loader and a backhoe. He continued work on the property in 1981. C. French began work at the site in August 1982, using a 685B Hi Hoe with .6 cubic metre (.75 cubic yard) bucket, and a loader.

D. Flick (4)
G. Gervais 105 M 14
Duncan Creek 63° 53'N, 135° 20'W
1980, 1981, 1982

This property is situated on upper Duncan Creek at the mouth of a small, unnamed left limit tributary, and just upstream from a 10 metre (33 feet) high waterfall.

Work at this site was begun in 1980 by D. Flick. He was joined in 1981 by G. Gervais, who moved from the Alexander property just upstream. Two people continued work in 1982, using two pieces of mining equipment.

M. Alexander (5)
G. Gervais 105 M 14
Nugget Drilling 63° 53'N, 135° 19'W
1978, 1979, 1980
1981, 1982

This property is situated on upper Duncan Creek, approximately 3.2 km (2 miles) due south of Keno City. Deposists at the site consist of 1 to 2 metres (3 to 6.5 feet) of colluvium and organic detritus overlying 12 to 18 metres (40 to 60 feet) of frozen laminated clayey black muck, and 3 to 6 metres (10 to 20 feet) of partially decomposed, possibly pre-glacial gravel. The operators at the site in 1982 believed the deposits were part of an old channel of upper Duncan Creek, which was situated south of the present creek. Bedrock is highly fissile carbonaceous sericite schist.

Work on the property in 1978 was done by M. Alexander, who mined all summer. In 1979, he transferred the property to his brothers B. and G. Alexander, who contracted G. Gervais to mine it in 1979 and 1980. The property was again transferred in 1981, this time to Nugget Drilling. Stripping was done along the right limit of the creek. Six people worked on the property in 1982, using a D8K bulldozer, a 980C loader, and a Hitachi UH 30 backhoe with 4.6 cubic metre (6 cubic yard) bucket. A Volvo dump truck with 13.8 cubic metre (18 cubic yard) capacity was used to haul tailings from the sluice box to the tailings pile.

E. Wiez (6)
Parent Creek 105 M 14
1978, 1979 63° 50'N, 135° 26'W
1980, 1981

This property is situated on Parent Creek, approximately 300 metres (1,000 feet) from its confluence with Duncan Creek. The gradient of the creek is steep. The elevation at the property is 45 metres (150 feet) higher than at the confluence of the creeks. Deposits at the site consist of glaciofluvial gravel with clasts up to 50 cm (20 inches) in diameter.

Mr. Wiez did test work on the property in 1978, 1979, 1980, and 1981 using a small bulldozer and a loader. He mined a small cut 6 metres (20 feet) deep but was not able to penetrate the glaciofluvial gravels.

Nugget Drilling (7)
Duncan Creek 105 M 14
1980, 1981 63° 50'N, 135° 28'W

This property is situated on Duncan Creek, just downstream from Parent Creek. Deposits at the site consist of well stratified glaciofluvial gravel with boulders up to 60 cm (24 inches) in diameter.

Work was begun in 1980, with six employees using two 980 C loaders and a Hitachi UH-30 backhoe with 4.6 cubic metre (6 cubic yard) capacity to mine. Material to be sluiced was fed by backhoe over a wire-rope net grizzly, from which the fraction less than 15 cm (6 inches) in diameter passed to a 12 metre (40 feet) long sluice box with two 1.2 metre (4 feet) wide channels. The finest grained portion of the material being sluiced was also washed through small pulsating sluices set at the end of each run.

A 600 metre (2,000 feet) long bedrock drain and a narrow settling pond 150 metres (500 feet) long were built in 1980. Work continued in 1981 using two D8K bulldozers, two 980 loaders, the UH-30 backhoe, and three Volvo trucks with 13.8 cubic metre (18 cubic yard) capacity. Up to twenty-eight people were active in the mining operation. They mined approximately 150,000 cubic metres (200,000 cubic yards) of material in 1981. Only test work was done on the property in 1982.

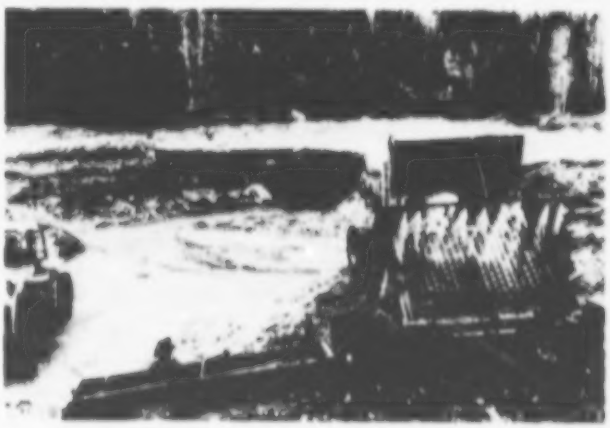
Gold from Duncan Creek is reported to have a fineness of 792-802. In addition to gold, limited amounts of wolframite, scheelite, botryoidal cassiterite ("wood tin") and zircon were recovered at this site.

A crew of seven carried out exploration work on this and other properties held by Nugget Drilling in the Mayo area in 1981 and 1982. They used a Stenuick reverse-casing drill from Belgium mounted on the back of the UH-30 backhoe to drill test holes 15 cm (6 inches) in diameter. The drill has an outer casing with left-hand thread, and an inner casing with right-hand thread. The inner casing and drill bit rotate eccentrically inside the outer casing, which rotates in the opposite direction. Cuttings are flushed out of the hole by compressed air or water.

F. Taylor (8)
Duncan Creek 105 M 14
1978, 1979, 1980 63° 48'N, 135° 29'W
1981, 1982

This property is situated on Duncan Creek, approximately 3.2 km (2 miles) downstream from its confluence with Williams Creek. The surface of the decomposed schist and siliceous schist bedrock at the site is very irregular, so that gravel deposits range from 2 to 7.5 metres (6 to 25 feet) in thickness. The deposits consist of sandy gravel, probably of glaciofluvial origin, and clayey gravel, possibly of preglacial origin. The sandy gravel contains small amounts of very fine grained magnetite, and garnet, while the clayey gravel contains abundant pyrite, and garnet.

F. Taylor mined approximately 9,000 cubic metres (12,000 cubic yards) from a cut 45 metres (150 feet) wide along the left limit and centre of the valley in 1978. He continued work in 1979, and 1980, when he worked using a D8 bulldozer and a Michigan 125B loader. He mined two cuts totalling 3,250 square metres (35,000 square feet) in area along the left limit of the creek, and used a grizzly and small sluice box with gravity fed water to process the material mined. The same equipment was used in 1981 to mine approximately 12,500 cubic metres (16,500 cubic yards) of material. In 1982, three people worked at the property using a D8H bulldozer, a Michigan 125B loader, and a 980C loader. They mined approximately 27,000 cubic metres (35,000 cubic yards) of material. Modifications made to the sluice box in 1982 included addition of a pump to spray water over the material as it passed over the grizzly, and the installation of punch-plate over expanded metal in the dump box.



Feeding the sluice box at the F. Taylor mining operation, Duncan Creek. The gravel is mined and transported from the cut in the background by loader, and dumped over the grizzly.

A. Pelland
E. Friesen (9)
Davidson Creek 105 M 11
1978, 1979, 1980 63° 45'N, 135° 25'W
1981, 1982

This property is situated along the right limit of Davidson Creek where it widens just downstream from a canyon. Deposits at the site are of glaciofluvial gravel, which has been partially reworked by Davidson Creek.

Mr. Pelland worked at the property using a small bulldozer in 1978, 1979, 1980, and 1981. In 1982, A. Friesen left his workings at Dawn Creek midway through the summer, and moved to Davidson Creek to mine.

Gold recovered from Davidson Creek is fine-grained and flat. It is reported to have a fineness of 840.

E. Friesen (10)
Dawn Creek 105 M 13
1978, 1979, 1980 63° 46'N, 135° 13'W
1981, 1982

This property is situated along the right limit of Dawn Creek, approximately 300 metres (1,000 feet) from its mouth at Mayo Lake. Deposits at the site consist of glaciofluvial gravel and blue clay. The clay may have been deposited in Mayo Lake when the lake level was higher than at present. The gravel and clay are frozen.

Mr. Friesen worked at this site in 1978, 1979, 1980, 1981, and part of 1982 using a small bulldozer and a small loader. His cut in the right limit bank is approximately 9 metres (30 feet) deep. During 1982, Mr. Friesen found that the gold-bearing portion of the deposit turned into the bank, which he then left to thaw prior to future mining operations.

View of site of the E. Friesen mining operation, Dawn Creek. Mayo Lake is in the background.

Gold from the portion of the creek 24 metres (80 feet) and less above the elevation of Mayo Lake is reported to be flat and worn, while gold from higher elevations is much less worn.

L. Wozniak (11)
Anderson Creek 105 M 11
1978, 1979, 1980 63° 43'N, 135° 02'W
1981, 1982

This property is situated on Anderson Creek approximately 400 metres (1300 feet) above its mouth at Mayo Lake, and is at the suspected upper limit of glacial debris on the creek. Approximately 3.5 metres (12 feet) of bouldery gravel overlie quartz-sericite schist at the site.

Mr. Wozniak and his family mined on a small scale at this location from 1978 to 1982 using a D4 bulldozer. Water for sluicing is directed through a control gate, and gravity-fed to the sluice box. Total creek flow is used.

Gold from this creek is reported to have a fineness of 840.

G. Hosack (12)
Unnamed Creek 105 M 10
1980 63° 44'N, 134° 58'W

This property is situated along an unnamed creek approximately 650 metres (2,500 feet) from its mouth on the northern side of the south arm of Mayo Lake, opposite Anderson Creek.

G. Hosack mined by hand at this site in 1980, and recovered a small amount of gold.

H. Moritz (13)
Meyer Properties Inc. 105 M 10
Steep Creek 63° 42'N, 134° 58'W
1978, 1979, 1980,
1981, 1982

This property is situated along Steep Creek near and at its mouth, midway along the southern shore of the south arm of Mayo Lake. Deposits at the site consist of up to 3.5 metres (12 feet) of glaciofluvial gravel with boulders up to 1.2 metres (4 feet) in diameter. A layer of blue glaciolacustrine clay 2 to 2.5 metres (6 to 8 feet) thick extends across the cut for a short distance. Bedrock is graphitic muscovite schist. The gradient of the creek is approximately 15%. There is abundant evidence of earlier hand mining operations on Steep Creek.

Mr. Moritz began work at this site in 1978, using a D7 bulldozer. He continued work in 1979, using the bulldozer and a Trojan loader with 1.5 cubic metre (2 cubic yard) bucket, and mined a cut 9 metres (30 feet) wide, 45 metres (150 feet) long, and 3.5 metres (12 feet) deep. Work was also done by Mr. Moritz in 1980 and 1981. Work in 1982

was done for Meyer Properties Inc. It consisted of a large testing program carried out on the delta of Steep Creek using a D9 bulldozer, and a Bantam backhoe.

Gold from Steep Creek is reported to have a fineness of 931 to 946, which is the highest of any creek in Yukon.

View upstream along Steep Creek. The Meyer Properties Inc. operation is at the apex of the delta at the mouth of Steep Creek.

B. Liske (14)
Eagles Nest 105 M 10
Meyer Properties Inc. 63° 41'N, 134° 51'W
Ledge Creek
1980, 1981, 1982

This property is situated near the mouth of Ledge Creek, midway along the northern shore of the south arm of Mayo Lake. Deposits at the site consist of post-glacial gravel at the apex of the Ledge Creek delta.

There is abundant evidence of old workings near the forks of Ledge Creek, upstream from the area mined between 1980 and 1982. B. Liske mined at the property in 1980, and may have worked there in 1979. In 1981, work was done by Eagles Nest, a consortium which mined using two 966 loaders, a 225 backhoe, and a 366 Bantam backhoe. A "Ram" washing plant was used to process the material mined. No mining was done in 1982, but Meyer Properties Inc. did a limited amount of test work at the site.

Gold from Ledge Creek is reported to have a fineness of 808 to 820. Cassiterite has been reported recovered from the creek.

K. Miner (15)
Cascade Creek 105 M 10
1981, 1982 63° 39'N, 139° 44'W

Cascade Creek flows into the north side of the southern arm of Mayo Lake. It has a steep gradient, and is confined to a canyon in its lower reaches. A small delta has built up on the edge of Mayo Lake at the mouth of Cascade Creek. Tailings from old workings are present in the middle reaches of the creek.

Mr. Miner worked with a D7 bulldozer and small loader-backhoe at the site of the old workings during 1981. He did two weeks' further work at the site in 1982.

Wolf Resources (16)
Nelson Creek 105 M 10
1981 63° 52'N, 134° 41'W

This property is situated along Nelson Creek just upstream from its confluence with South Nelson Creek, and approximately 3 km (1.9 miles) east of the end of the south arm of Mayo Lake.

There is evidence of old mining in this area. In 1981, Wolf Resources did a limited amount of work at this site, as well as test work on South Nelson Creek and on lower Nelson Creek.

NOTES

105 N

HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983.
DOTS INDICATE PLACER MINING OPERATIONS ACTIVE DURING THE PERIOD 1978 TO 1982. NUMBERS BESIDE THE DOTS RELATE TO THE TEXT.

LANSING

YUKON TERRITORY

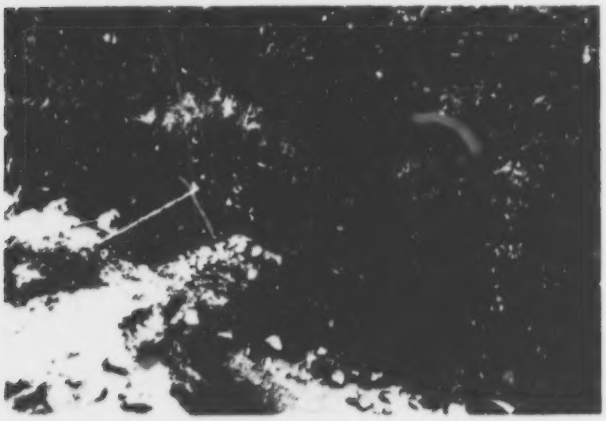
5 0 5 10 15 20 25 30

KILOMETRES

PLACER MINING OPERATIONS IN THE LANSING MAP AREA, NTS 105 N

Noranda Exploration Ltd. (1)
Dawson Mining Equipment Ltd. 105 N 3
Russell Creek 63° 07'N, 133° 24'W
1981, 1982

This property is situated on Russell Creek, above and below its confluence with Limestone Creek. The Russell Creek Valley is narrow, and deeply incised. Deposits in the creek valley are 8.5 to 12.8 metres (28 to 42 feet) thick, and consist of 2 metres (6 feet) of glaciofluvial and stream gravel overlying 2 metres (6 feet) of grey-black massive to laminated clay and 4.5 to 8.8 metres (16 to 30 feet) of glaciofluvial and possibly pre-glacial gravel.



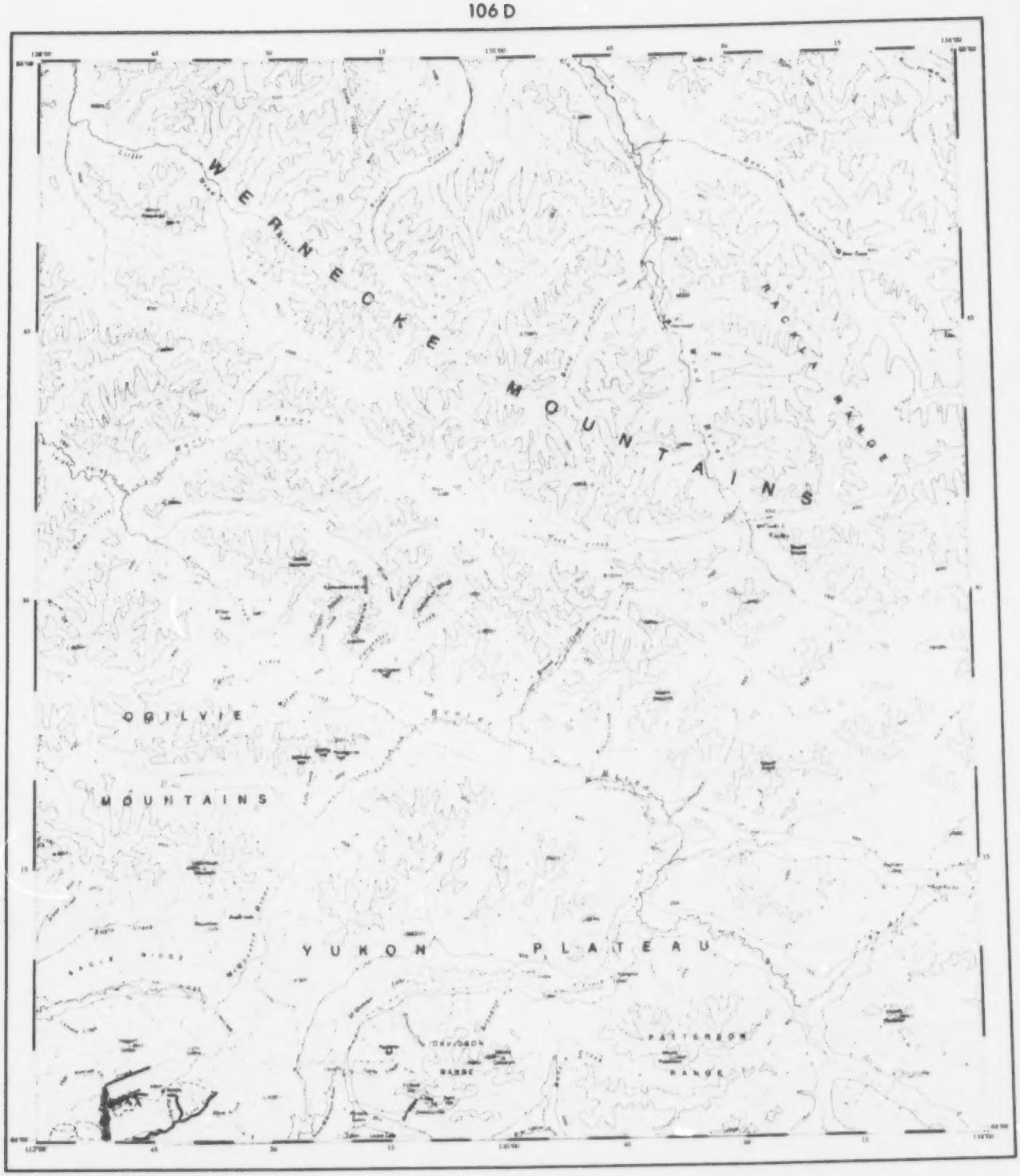
Deposits at the Russell Creek property of Noranda Exploration Ltd. Glaciofluvial gravel, massive clay and a second horizon of glaciofluvial gravel are visible in the wall of this test pit. The loader bucket at the left of the photograph provides a scale.

Although this site lies almost 100 km (63 miles) from the placer mining region surrounding Mayo Lake, the placer deposits at Russell Creek have been known since at least 1899. They were mined by hydraulic methods, and drilled with a Keystone drill between 1902 and 1908, and were mined and drilled again between 1921 and 1926.

Noranda Exploration Ltd. optioned the property from Dawson Mining Equipment Ltd. and carried out large bulk sampling and drilling programs in 1981 and 1982. One D6C bulldozer, one D8K bulldozer, and one 988B loader with 5.4 cubic metre (7 cubic yard) bucket were used in 1981. Approximately 17,000 cubic metres (22,000 cubic yards) of material were sluiced through a "Placer King 500" washing plant, which proved inadequate to handle the numerous boulders up to 60 cm (24 inches) in diameter found at the site. An additional 115,000 cubic metres (150,000 cubic yards) of material were moved during the preparation of two large settling ponds in 1982. An airstrip was also built. Ten employees worked on the property in 1982, using the same equipment as in 1981 plus a Trojan loader with 2.3 cubic metre (3 cubic yard) bucket, and a "Sonic" drill with 16.5 cm (6.5 inch) diameter rods. Approximately 3,000 cubic metres (4,000 cubic yards) of material from below the clay layer in test pits was sluiced. Sluicing water was treated in 4 settling ponds totalling 425 metres (1,400 feet) in length. Test holes totalling 1,000 metres (3,300 feet) were drilled at 87 sites along an 8 km (5 mile) long section of Russell Creek.

Gold recovered during the 1981 and 1982 tests was fine grained. In a typical sample, only 2% was coarser than 10 mesh (1.5 mm or .06 inches), 20% was finer than 10 mesh but coarser than 20 mesh (.8 to 1.5 mm or .03 to .06 inches), 45% was finer than 20 mesh but coarser than 40 mesh (.4 to .8 mm or .015 to .03 inches), and 30% was finer than 40 mesh (.4 mm or .015 inches). The gold grains were most commonly flat.

106 D



HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983.
DOTS INDICATE PLACER MINING OPERATIONS ACTIVE DURING THE PERIOD 1978 TO 1982. NUMBERS BESIDE THE DOTS RELATE TO THE TEXT.

NASH CREEK
YUKON TERRITORY

5 0 5 10 15 20 25 30
KILOMETRES

PLACER MINING OPERATIONS IN THE NASH CREEK MAP AREA, NTS 106 D

Darron Placers (1)
Canada Tungsten Mining Corp. Ltd. 106 D 4
Queenstake Resources Ltd. 64° 02'N, 135° 50'W
Dublin Gulch
1978, 1979, 1980,
1981, 1982

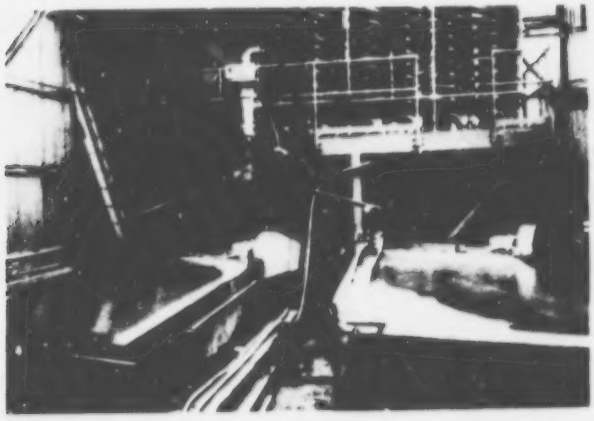
This property is situated along Dublin Gulch, near its confluence with Haggart Creek. Mining has been done at this site intermittently since 1898. During the early 1940's, miners on Dublin Gulch received preferential treatment with regard to the availability of rationed heavy equipment parts, and road maintenance, because of the tungsten they recovered.

The deposits at this site are up to 18 metres (60 feet) deep, and consist of glaciofluvial gravel, and pre-glacial gravel. The gold-bearing portion of the pre-glacial channel was partially removed and reworked by glacial action, and partially buried by glaciofluvial deposits. Significant amounts of scheelite, and minor amounts of arsenopyrite, pyrite, hematite, wolframite, garnet, cassiterite, magnetite, tourmaline, and galena are recovered along with gold from the Dublin Gulch Deposits.

Darron Placers mined in 1978 using a D7 bulldozer, a 955 tracked loader, a 966B loader, and a Hough 100 loader. They mined approximately 7,500 cubic metres (10,000 cubic yards) of material from a cut along the right limit, and approximately 23,000 cubic metres (30,000 cubic yards) of material from a cut along the left limit. They used a sluice box with grizzly to recover gold, followed by a vibrating sluice to recover scheelite. Although they did not use the vibrating sluice for much of the 1978 season, they recovered 5.4 tonnes (6 tons) of scheelite in it in 1977. Darron Placers sold the property to Canada Tungsten Mining Corp. Ltd. in 1978. Work done by Canada Tungsten in 1978 indicated that tailings from earlier mining operations could be mined economically at a rate of 153,000 to 191,000 cubic metres (200,000 to 250,000 cubic yards) per year over five years. A processing plant with trommel and 12 jigs capable of processing 1,500 cubic metres (2,000 cubic yards) of material per day was built in 1979 at a cost of $1,558,000. It ran for a one month test in September with good results for the recovery of fine-grained gold, and scheelite. Mining in 1980 was done using a 931B tracked loader-backhoe, a 631B scraper-loader, and other equipment. Four spiral concentrators and two separation tables were added to the processing plant to upgrate the jig concentrates. Work was done on two twelve hour shifts per day from June 15 to September 20. A total of 95,500 cubic metres (12,000 cubic yards) of material were processed, from which 26.3 tonnes (29 tons) of table concentrates and 136 tonnes (150 tons) of jig concentrates were recovered. Mining in 1981 was done by 26 people working on two shifts. They used a D7G and a D8K bulldozer, two 980C loaders, a 931B backhoe, a 627 scraper-loader, and two off-highway Mack trucks. Some modifications were made to the processing plant during the year. A "Derocker" was added. It removed all clasts coarser than 5 cm (2 inches) in diameter before any material reached the trommel. Because of the clayey matrix of some of the gravel at Dublin Gulch, and the gentle action of the "Derocker", gravel could not be adequately washed on it at an acceptable rate, so part way through the season the "Derocker" was removed and the gravel was fed directly to the trommel. Only grains less than 1.9 cm (.75 inches) in diameter passed

View upstream along Dublin Gulch at the Canada Tungsten Mining Corp. Ltd. property. Four settling ponds and the camp are in the foreground. The mining area and processing plant are in the centre of the photograph. Potato Hills are visible in the background. The Dublin Gulch lode gold occurrence lies in the centre distance of this scene. The Ray Gulch tungsten deposits lies to the right (south) of the photograph.

through the trommel to go on to the jigs. Four additional spiral concentrators were set up to further process the jig concentrates. Approximately 1,150 cubic metres (1,500 cubic yards) of material were processed daily in 1981. Mining was not done at Dublin Gulch in 1982. The gold production did not meet expectations due to the presence of significantly lower grades than were indicated by earlier sampling, and a pre-tax operating loss of $3,100,000 was recorded.



View of spiral concentrators and separation tables at Canada Tungsten Mining Corp. Ltd. Dublin Gulch mining operation. The dark areas on the tables are covered by a mixture of heavy minerals and water.

Canada Tungsten Mining Corp. Ltd. began an extensive exploration and evaluation program of placer deposits in Dublin Gulch and the surrounding area in 1980, when trenches were dug on Swede and Secret Creeks. In 1981 and 1982, surficial geology surveys, bulk sampling, and drilling were done on Haggart Creek and its tributaries. There were 152 holes totalling 2,087 metres (6,845 feet) drilled. A Becker hammer drill, and a Schramm T64H air rotary drill, both mounted on Nodwells were used for drilling. The hammer drill was not effective for holes more than 15 metres (50 feet) deep, but was more effective than the air rotary drill at including any gold encountered with the rest of the sample. Twenty-six holes totalling 304 metres (997 feet) were drilled with the hammer drill, and 126 holes totalling 1,783 metres (5,848 feet) were drilled with the air rotary drill. Holes were drilled on Gill Gulch, Ray Gulch, Dublin Gulch, and Haggart, Secret, and Swede Creeks. One hole 82 metres (268 feet) deep on Lynx Creek failed to reach bedrock, although shallower holes elsewhere on the creek did reach bedrock. The 47.5 metre (156 feet) hole drilled on Ray Gulch also failed to reach bedrock. Reserves outlined along the left limit of Dublin Gulch totalled 110,000 cubic metres (145,000 cubic yards) of material containing approximately 250,000 grams (8,000 ounces) of gold and 16,500 kg (36,000 pounds) of scheelite. These reserves were blanketed by approximately 285,000 cubic metres (375,000 cubic yards) of waste material.

Gold production from Dublin Gulch since 1898 is approximately 544,300 grams (17,500 ounces) of crude gold. The gold is reported to have a fineness of 860 to 923.

A. Ritter (2)
F. Schomig
W. Malicky 106 D 4
Haggart Creek 64° 01'N, 135° 51'W
1982

This property is situated along the left limit of Haggart Creek, approximately 2.2 km (1.4 miles) downstream from the mouth of Dublin Gulch. Deposits at the site consist of 1.5 to 2.5 metres (5 to 8 feet) of clayey gravel overlying .5 to 1.2 metres (2 to 4 feet) of black mucky silt, and 1.2 to 3 metres (4 to 10 feet) of well washed gravel in which most of the clasts are less than 15 cm (6 inches) in diameter. The deposits are not frozen. The lower gravel unit appears to have been deposited at the upstream end of a large meander channel in which water flowed east across the Haggart Creek Valley. It is stained by limonite (iron), and psilomelane (manganese). Bedrock is siliceous blocky weathering grey quartzite.

Work at this site was previously done about 1965 by K. Djukastein. In 1982, Messrs. Ritter, Schomig, and Malicky enlarged the cut left by Mr. Djukastein. They began work in August using a D8K bulldozer, and a 930 loader with 1.9 cubic metre (2.5 cubic yard) bucket, and a small sluice box with grizzly, and gravity-fed water.

Gold from Haggart Creek is reported to have a fineness of 885 to 895. Pebbles and cobbles of hematitic iron formation transported from the Snake River area by glacial action, and arsenopyrite, scheelite, wolframite, and gold are recovered from the deposits at this location.

T. Takis (3)
E. Sevosik
W. Malicky 106 D 4
Haggart Creek 64° 01'N, 135° 51'W
1982

This property is situated along the right limit of Haggart Creek directly opposite the left limit operation of A. Ritter, F. Schomig and W. Malicky. Deposits at the site consist of 2 metres (6 feet) or less of sandy gravel. Some permafrost is present.

In 1982, Messrs. Takis, Sevosik, and Malicky worked at this site for part of the season using a small John Deere bulldozer and a small JCB loader-backhoe. Water for sluicing was pumped from a holding pond.

G. Manson (4)
Fifteen Pup 106 D 4
Haggart Creek 64° 00'N, 135° 52'W
1978, 1979, 1980, 1981, 1982

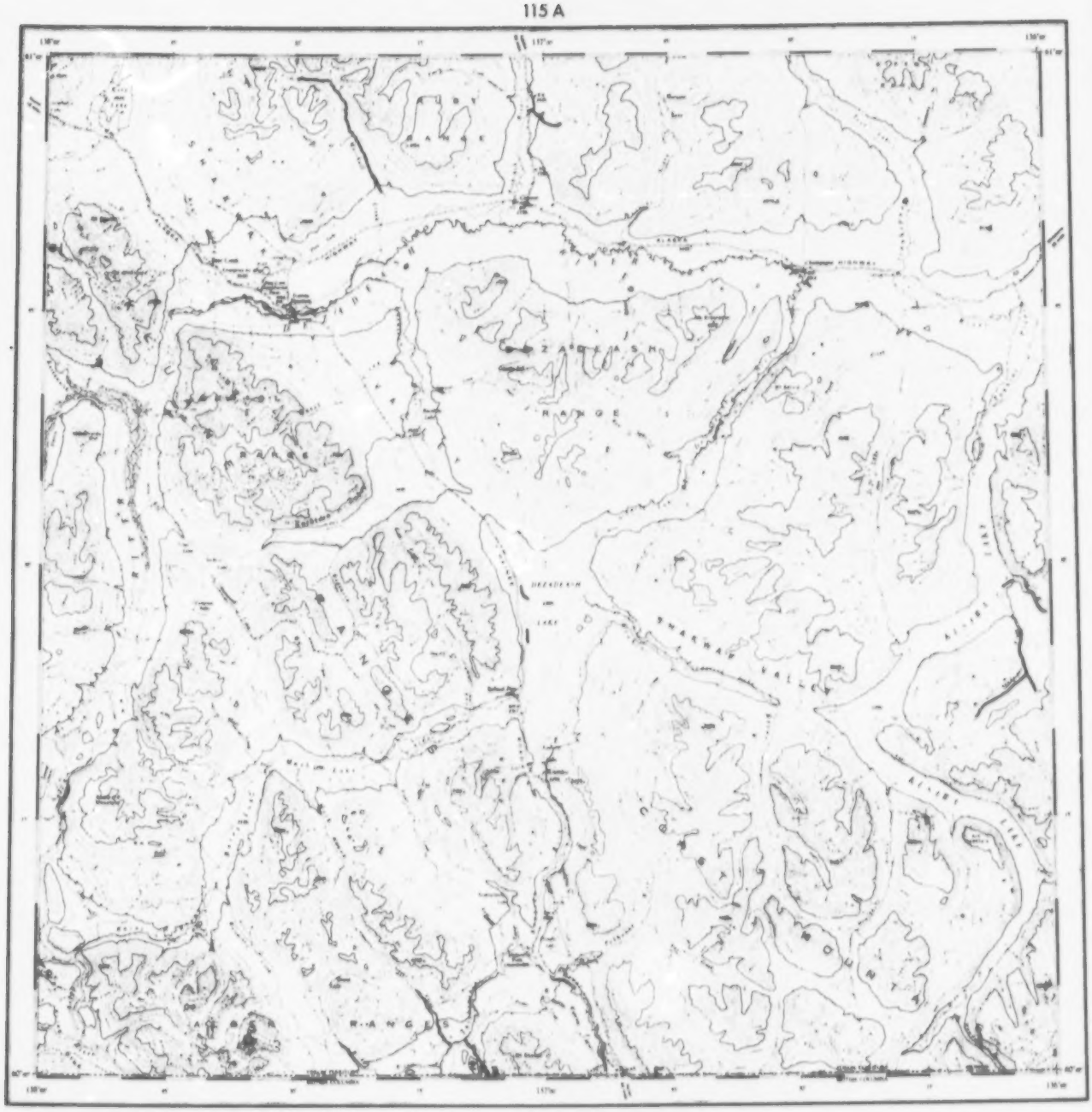
This property is situated at the mouth of Fifteen Pup, a left limit tributary of Haggart Creek approximately 3.2 km (2 miles) downstream from Dublin Gulch. Deposits at this site are located on a "bench" approximately 24 metres (80 feet) above the present level of Haggart Creek, and consist of .5 to 2 metres (2 to 6 feet) of clayey colluvium overlying a thin jumbled gravel unit, .5 to 1.2 metres (2 to 4 feet) of parallel laminated sand and gravel, and at least

3.5 metres (12 feet) of parallel and cross laminated sand. Unconsolidated deposits or bedrock underlying the sand were not exposed. The thin gravel unit appears to be the result of post-glacial deposition in Fifteen Pup, while paleoflow indicators suggest that the laminated sand and gravel are a result of glaciofluvial deposition in a deep and wide stream in the Haggart Creek valley. Additional glaciofluvial deposits, or pre-glacial deposits may be preserved beneath the sand near the mouth of Fifteen Pup.

G. Manson mined at this site each year form 1978 to 1982 using an International TD-I bulldozer, and a loader-backhoe unit with .75 cubic metre (1 cubic yard) loader bucket. He used a small sluice box with grizzly, and gravity-fed water to process the material mined.

Gold recovered from this site is flat, worn, and shiny. Much of it is finer than 32 mesh (.5 mm or .02 inches).

115 A



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DOTS INDICATE PLACER MINING OPERATIONS ACTIVE DURING THE PERIOD 1978 TO 1982. NUMBERS BESIDE THE DOTS RELATE TO THE TEXT.

DEZADEASH

YUKON TERRITORY

0 5 0 5 10 15 20 25 30

KILOMETRES

PLACER MINING OPERATIONS IN THE DEZADEASH MAP AREA, NTS 115 A

G. Yardley (1)
Kimberley Creek 115 A 13
1982 60° 49'N, 137° 59'W

This property is located along the right limit of Kimberley Creek, approximately 7.5 km (4.7 miles) upstream from its confluence with Jarvis River. Deposits at the site consist of 2 metres (6 feet) of gravel. There is no black muck present.

Work at this site was begun in 1982. A D7 bulldozer and a 950 loader with 2.3 cubic metre (3 cubic yard) bucket were used to mine a small test cut. The material mined was processed through a 50 cm (20 inches) wide sluice box 3.7 metres (12 feet) long. Water for sluicing was gravity-fed.

Yukon Gold Holdings (2)
Dollis (Squaw) Creek 115 A 3
1982 60° 00'N, 137° 08'W

This property is situated approximately .5 km (.3 miles) downstream from the British Columbia/Yukon border. Deposits at this site consist of 1.2 metres (4 feet) of gravel. There is no black muck present.

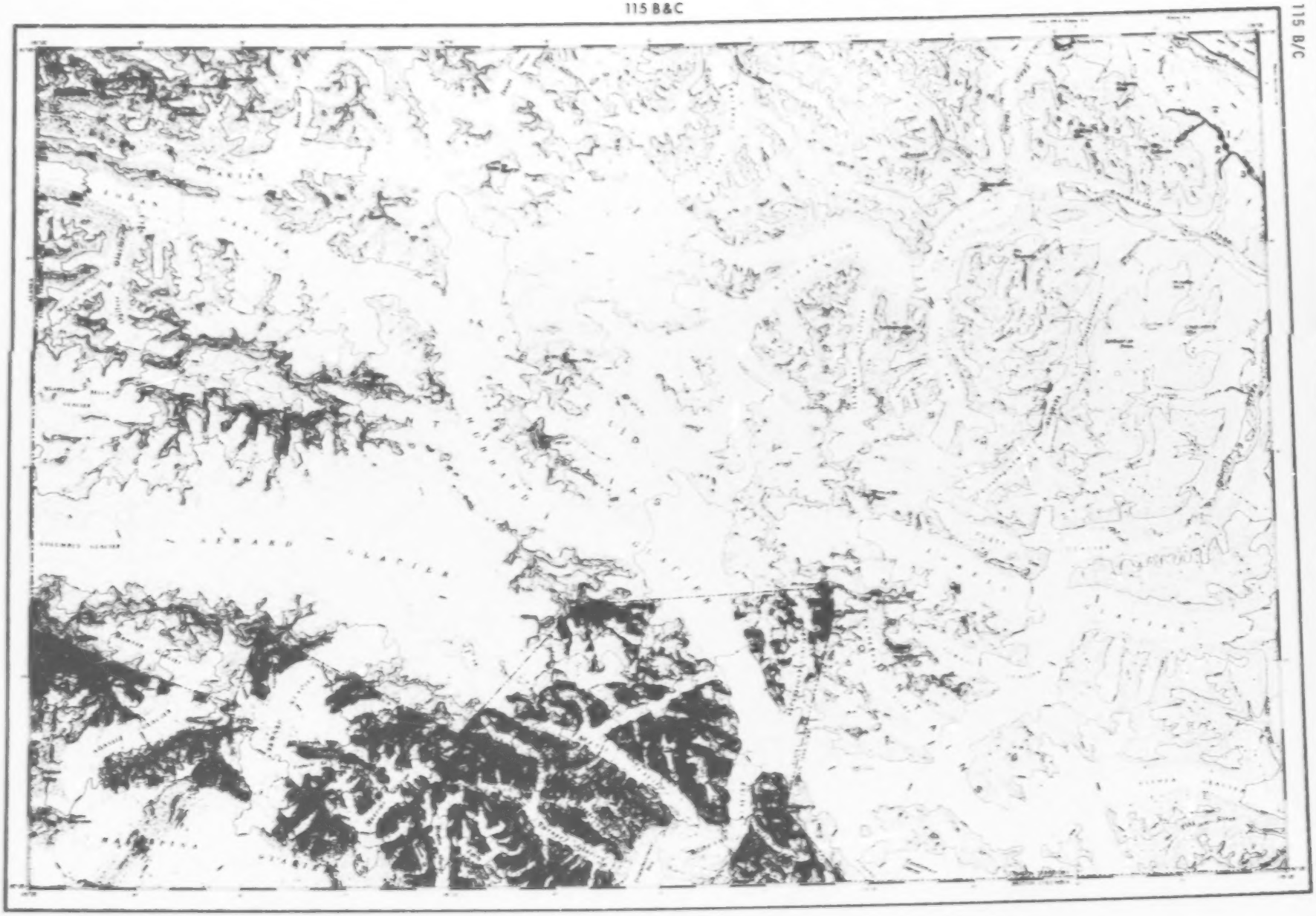
Work at this site, which had been mined previously, was begun by Yukon Gold Holdings in 1982. Four people worked using a D4 bulldozer, a 966 loader with 2.3 cubic metre (3 cubic yard) bucket and 75 cm (30 inches) wide sluice box 7.3 metres (24 feet) long. Water for sluicing was gravity-fed.

W. Yates (3)
Dollis (Squaw) Creek 115 A 3
1982 60° 00'N, 137° 08'W

This property is situated along the right limit of Dollis Creek, immediately north of the British Columbia/Yukon border.

Work at this site was begun in 1982. Test holes were dug in gravel to a depth of 3.5 metres (12 feet) using a D6 bulldozer. Mining was then begun using a D7 bulldozer and a 966 loader with 3 cubic metre (4 cubic yard) bucket. The gravel mined was screened, and the undersize was moved to the sluice box by way of a 10.5 metre (35 feet) long conveyor. Three settling ponds were used to treat sluicing water. When the cut reached 15 metres (50 feet) in depth in July without meeting bedrock, Mr. Yates stopped work at this site and moved upstream to his property in British Columbia.

115 B/C



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DOTS INDICATE PLACER MINING OPERATIONS ACTIVE DURING THE PERIOD 1970 TO 1982. NUMBERS BESIDE THE DOTS RELATE TO THE TEXT

MOUNT ST ELIAS

CANADA / UNITED STATES OF AMERICA

5 0 5 10 15 20 25 30

KILOMETRES

PLACER MINING OPERATIONS IN THE MOUNT ST. ELIAS MAP AREA, NTS 115 B/C

A. Allison (1)
Telluride Creek 115 B 16
1982 60° 52'N, 138° 06'W

This property is situated along Telluride Creek approximately 2 km (1.2 miles) above its confluence with Jarvis River. Telluride Creek is muddy, approximately 1.2 metres (4 feet) wide and .5 metres (1.5 feet) deep, and has a steep gradient. Gravel deposits at the site are shallow.

A. Allison carried out a small hand mining operation using gravity-fed water for sluicing at this location in 1982.

R. Istchenko (2)
Telluride Creek 115 B 16
1981, 1982 60° 52'N, 138° 06'W

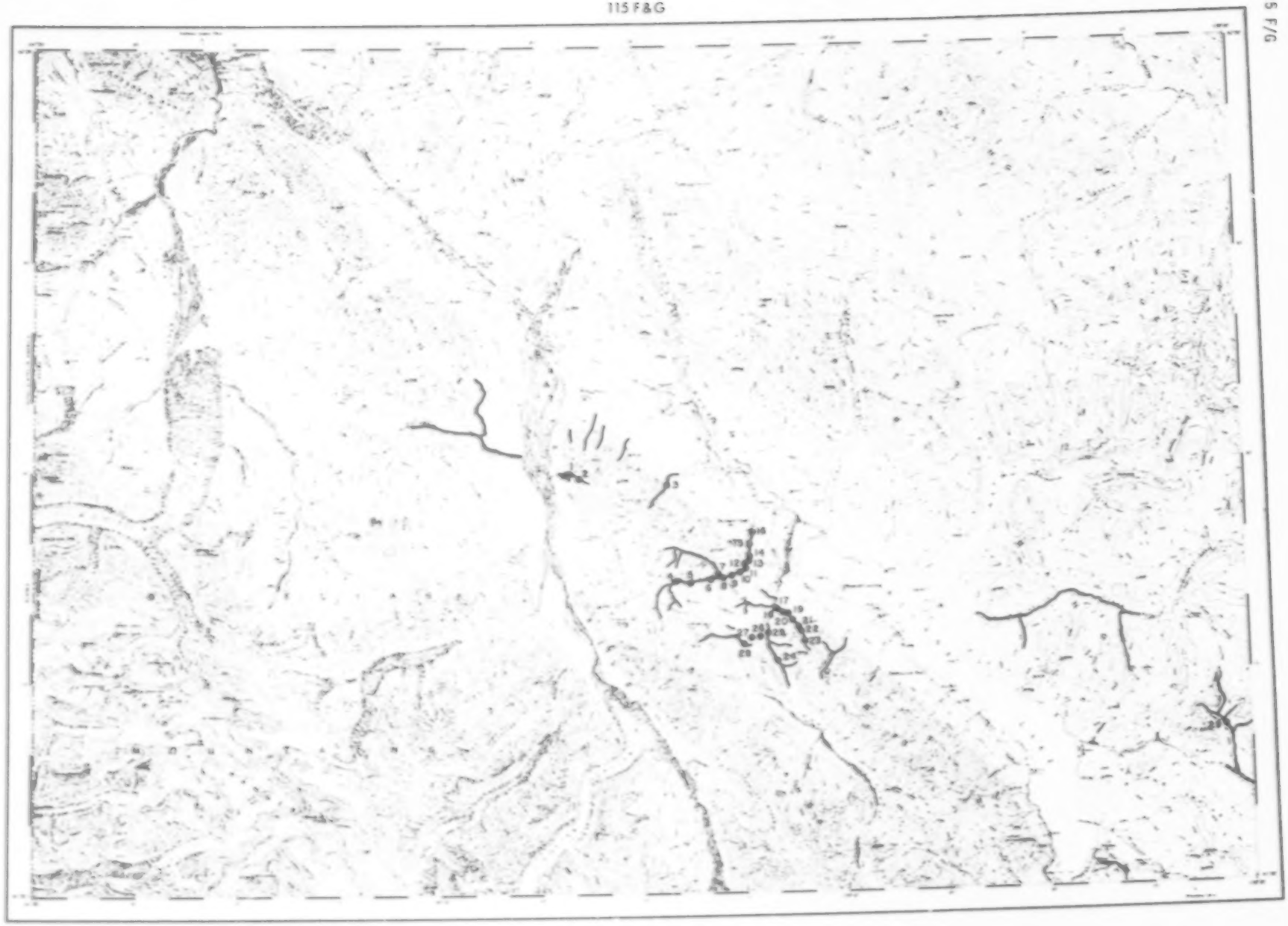
This property is situated along Telluride Creek, on the gravel flood-plain just upstream from its confluence with Jarvis River.

R. Istchenko began work at this location in 1981 using a loader-backhoe unit with .6 cubic metre (.75 cubic yard) loader bucket, and a 4.9 metre (16 feet) long sluice box. He mined a small cut in 1981, and used the same equipment to mine a second small cut in 1982.

C. Sawyer (3)
Kimberley Creek 115 B 16
1980, 1981, 1982 60° 50'N, 138° 02'W

This property is situated along the right limit of Kimberley Creek, approximately 3.8 km (2.4 miles) above its confluence with Jarvis River. Deposits at the site consist of .5 to 6 metres (2 to 20 feet) of gravel.

Work was begun in 1980, when testing was done by hand. Mining was done by four people using a John Deere 350 bulldozer, a D6 bulldozer, and a Drott backhoe with .4 cubic metre (.5 cubic yard) bucket in 1981. Only the lowermost metre (3 feet) of gravel was sluiced. Gravel more than one metre (3 feet) above bedrock was stripped. The sluice box was 60 cm (24 inches) wide and 6 metres (20 feet) long. A vibrating grizzly removed all material coarser than 4 cm (1.5 inches) in diameter prior to sluicing. Four people continued work at the site in 1982 using the same equipment as in 1981 plus a 980C loader.



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KLUANE LAKE

YUKON TERRITORY

115 F/G

PLACER MINING OPERATIONS IN THE KLUANE LAKE MAP AREA, NTS 115 F/G

R. Braun (1)
Arch Creek 115 G 5
1980, 1981, 1982 61° 30'N, 139° 41'W

This property is situated along Arch Creek, approximately 2.6 km (1.6 miles) upstream from its confluence with Donjek River.

Two people mined at this site each season from 1980 to 1982 using a small backhoe.

M. Melanson (2)
Arch Creek 115 G 5
1980, 1981, 1982 61° 29'N, 139° 39'W

This property is situated along the middle portion of Arch Creek, approximately 4.6 km (2.9 miles) upstream from its confluence with Donjek River.

M. Melanson mined by hand at this location in 1980, 1981, and 1982.

G. Magenson (3)
McCrory Holdings 115 G 6
Quill Creek 61° 29'N, 139° 27'W
1980, 1981, 1982

This property is situated along Quill Creek at the mouth of a left limit tributary approximately 10.5 km (6.5 miles) upstream from the Alaska Highway.

G. Magenson and McCrory Holdings did a limited amount of work at this site in 1980, 1981, and 1982.

M. Flynn (4)
Burwash Creek 115 G 6
1979, 1980, 61° 22'N, 139° 25'W
1981, 1982

This property is situated along the right limit of Burwash Creek, approximately .8 km (.5 miles) downstream from the mouth of the Cooper Creek.

One or two people worked at this location each year between 1979 and 1982 using a D7 bulldozer. Water for sluicing was pumped.

Cooper Creek Mining Company (5)
Burwash Creek 115 G 6
1978, 1981 61° 22'N, 139° 26'W

This property is situated along Burwash Creek, approximately 3.4 km (2.1 miles) downstream from the mouth of Cooper Creek. Deposits at the site consist of 3.5 to 6 metres (12 to 20 feet) of gravel. Boulders in the gravel are not as large at this location as they are at locations further downstream.

This property was staked by F. LeFebvre in 1971. Six people mined on it that year. Only assessment work was done in 1972. Mining was done for a limited time during 1973, and for the entire season in 1974. The 1974 cut was along the right limit, and was approximately 6 metres (20 feet) wide and 90 metres (300 feet) long. A cut opposite the 1974 cut was mined in 1975. No work was done in 1976 or 1977.

Mining was done along the right limit by three people in 1978 using a D8 bulldozer, and a Michigan 175A loader with 1.9 cubic metre (2.5 cubic yard) bucket. No work was done in 1979 or 1980. Four people worked at the property in 1981 using a D9 bulldozer and the Michigan loader to mine along the right limit. No work was done in 1982.

Gold from Burwash Creek is reported to have a fineness of 871 to 876.

Kluane Resources (6)
Burwash Creek 115 G 6
1981, 1982 61° 22'N, 139° 20'W

This property is situated on Burwash Creek approximately 250 metres (800 feet) upstream from its confluence with Tatamagouche Creek. It has been mined previously, and drilled. There is no muck present. The section consists of 2 to 2.5 metres (6 to 8 feet) of clast supported gravel with rounded boulders 15 to 45 cm (6 to 18 inches) in diameter.

Kluane Resources began work on the property in 1981. Eight to ten people worked two shifts using a D9G bulldozer to rip up and stockpile gravel, and a 980C loader to feed the sluice box. A "Ross" sluice box capable of processing 230 cubic metres (300 cubic yards) of material per hour was used. Three settling ponds were constructed. Work on the property during 1982 began in August. It was done by 6 employees.

W. Jones (7)
Burwash Creek 115 G 6
Tatamagouche Creek 61° 23'N, 139° 19'W
1978

This property is situated on Burwash Creek at the mouth of Tatamagouche Creek. Mining on the low right limit bench on Burwash Creek opposite the mouth of Tatamagouche Creek was begun in 1975 and completed in 1977.

W. Jones used a D4 bulldozer to do assessment work on Tatamagouche Creek in 1978. In September, the bulldozer did a half roll while climbing a steep bank, killing Mr. Jones.

2595 Yukon Ltd. (8)
Burwash Creek 115 G 6
1982 61° 22'N, 139° 19'W

This property is situated on the right limit of Burwash Creek, immediately downstream from the mouth of Tatamagouche Creek. The deposits consist of .3 metres (1 foot) of muck overlying 2 to 2.5 metres (6 to 8 feet) of coarse gravel.

Work at this site began in September, 1982. A D9G bulldozer and a 980C loader were used.

M. Turnbull (9)
Burwash Creek 115 G 6
1980, 1981, 1982 61° 22'N, 139° 17'W

This property is situated along the left limit of Burwash Creek, approximately 1.9 km (1.2 miles) downstream from the mouth of Tatamagouche Creek.

Two people worked at this site in 1980, 1981, and 1982.

J. Tardiff (10)
Burwash Creek 115 G 6
1980, 1981 61° 22'N, 139° 16'W

This property is located along Burwash Creek, approximately 2.9 km (1.8 miles) downstream from the mouth of Tatamagouche Creek.

J. Tardiff worked alone using a D7 bulldozer to mine at this site in 1980 and 1981.

Alsace Mining (11)
Burwash Creek 115 G 6
1978, 1979, 1980 61° 23'N, 139° 16'W
1981, 1982

This property is situated on a right limit bench, approximately 3 metres (10 feet) above Burwash Creek. The section consists of gravel with coarse, rounded boulders. Deposits at creek level have been previously mined.

Mr. R. Muller has worked on this property since 1973. In some years, ground preparation work was done, and in others, cuts of approximately 950 square metres (10,000 square feet) in area were mined.

D. Miller (12)
D. Storing 115 G 6
Burwash Creek 61° 23'N, 139° 15'W
1979, 1980,
1981, 1982

This property is situated along the left limit of Burwash Creek, approximately 5.8 km (3.6 miles) upstream from the Alaska Highway.

Two or three people worked at this site each year from 1979 to 1982 using a TD-7E bulldozer, and loader. Work in 1982 was done communally with D. Storing, who did test work on an adjacent property.

L. Tremblay (13)
2540 Yukon Ltd. 115 G 6
Burwash Creek 61° 23'N, 139° 15'W
1978, 1979, 1980
1981, 1982

This property is situated on Burwash Creek at the lower canyon. Slide rock from the valley walls has buried gravel deposits along the right limit of the creek at this site. One section from the right limit consisted of 1.2 to 2 metres (4 to 6 feet) of muck and locally derived bedrock slabs overlying 1.2 to 2 metres (4 to 6 feet) of coarse gravel and .5 metres (2 feet) of sand.

Work at this site began in 1978 when Mr. Tremblay and a helper dug several test pits along the right limit of the creek. In 1979, two people worked on weekends at the property. They did some hydraulicking to remove muck, and used a small JD bulldozer to push gravel over a stationary grizzly with 7.5 cm (3 inch) spacing and into a 50 cm (20 inch) by 9 metre (30 feet) sluice box. Work continued on weekends, and throughout July during 1980. In 1981, Mr. Tremblay and a helper used a small JD bulldozer, and loader with .2 cubic metre (.25 cubic yard) bucket for their work. 2540 Yukon Ltd. leased part of the property during 1981, and four people working with a D7 bulldozer and 980 loader constructed a creek diversion, drainage ditches, and settling ponds. In 1982, Mr. Tremblay began work in August on the left limit of the creek with a D8 bulldozer, and a Michigan 175 loader with 1.9 cubic metre (2.5 cubic yard) bucket. There was a 2.5 to 3 metre (8 to 10 feet) thick section of gravel at that site.

G. Jones (14)
Burwash Creek 115 G 6
1981, 1982 61° 23'N, 139° 14'W

This property is situated on a left limit bench of Burwash Creek, approximately 5 km (3 miles) upstream from the Alaska Highway. Frozen gravel deposits 1.2 metres (4 feet) thick are being mined.

Work began on the property in 1981. Three people working part-time shovelled gravel into a 25 cm (10 inch) by 4 metre (14 feet) sluice box. A 5 hp. pump provided water for sluicing. Operations continued, although on a reduced scale, in 1982.

Snag River Placers (15)
W. Woolsey 115 G 6
Burwash Creek 61° 25'N, 139° 14'W
1982

This property is situated on the right limit of Burwash Creek, approximately 2.4 km (1.5 miles) upstream from the bridge at the Alaska Highway. The section consists of 1.5 metres (5 feet) of coarse gravel. Overburden has been previously stripped, and creek deposits at the property have been previously mined.

Snag River Placers began work in 1982. A pumping pond, and a settling pond were constructed. A Drott 40 backhoe with .6 cubic metre (3/4 cubic yard) bucket was used to mine and feed the sluice box. A 922 bulldozer was used to remove tailings.

JBSCH Mining (16)
Burwash Creek 115 G 6
1979, 1980, 1981, 1982 61° 25'N, 139° 14'W

This property is located along the left limit of Burwash Creek, approximately 1.3 km (.8 miles) upstream from the Alaska Highway.

Mining was done at this site by two or three people each year from 1979 to 1982.

G. Mogenson (17)
Squirrel Creek 115 G 6
1980, 1981, 1982 61° 20'N, 139° 10'W

This property is situated on Squirrel Creek, just upstream from its confluence with Duke River.

G. Mogenson worked at this location in 1980, 1981, and 1982 doing testing.

J. Simmons (18)
Squirrel Creek 115 G 6
1978, 1979, 1980 1981, 1982 61° 20'N, 139° 19'W

This property is situated along Squirrel Creek, approximately 1 km (.6 miles) upstream from its confluence with Duke River.

J. Simmons mined on a small scale at this location each season from 1978 to 1982.

G. LeMoignan (19)
Squirrel Creek 115 G 6
1980, 1981, 1982 61° 20'N, 139° 19'W

This property is situated along Squirrel Creek, approximately 1.5 km (.9 miles) upstream from its confluence with Duke River.

Four people worked at this location in 1980, 1981, and 1982.

T. Bradley (20)
Squirrel Creek 115 G 6
1980, 1981, 1982 61° 19'N, 139° 08'W

This property is situated along Squirrel Creek, approximately 2.2 km (1.4 miles) upstream from its confluence with Duke River. Mining has been done previously at this site. T. Bradley has recovered a limited amount of mercury left by the earlier operators.

Work was begun at this location by Mr. Bradley in 1980 using a D4 bulldozer and 944 loader. Stripping was done, but sluicing was not done. Work continued in 1981. Sluicing was done from May to September. A reservoir holding approximately 2,000,000 litres (450,000 gallons) was constructed to treat sluicing water, and to store it for recirculation. Two people mined using the same equipment in 1982.

K. Reimer (21)
Squirrel Creek 115 G 6
1981, 1982 61° 19'N, 139° 07'W

This property is situated along the middle portion of Squirrel Creek, approximately 3.2 km (2 miles) from its confluence with Duke River.

Mining at this location was begun in 1981. Four people continued work in 1982.

P. Van Klaveren (22)
Squirrel Creek 115 G 6
1982 61° 18'N, 139° 07'W

This property is located along the middle portion of Squirrel Creek, approximately 4.2 km (2.6 miles) upstream from its confluence with Duke River. Deposits at the site consist of .3 metres (1 foot) of muck overlying 2 metres (6 feet) of gravel.

Mining operations were begun in 1982 using a John Deere 1010 loader with .6 cubic metre (.75 cubic yard) bucket, and a 60 cm (24 inches) wide sluice box 6 metres (20 feet) long. Two small ponds were constructed for settling and recirculating sluicing water.

Tic Construction (23)
Squirrel Creek 115 G 6
1980, 1981, 1982 61° 17'N, 139° 06'W

This property is located near the headwaters of Squirrel Creek, and well above the tree-line.

Two people worked at this site in 1980, 1981, and 1982 using a D6 bulldozer.

Tic Construction (24)
Ptarmigan Creek 115 G 6
1981, 1982 61° 16'N, 139° 10'W

This property is situated along the upper portion of Ptarmigan Creek, approximately 5 km (3.1 miles) upstream from its confluence with Duke River.

Test work was done at this location in 1981 and 1982 by two people using a D6 bulldozer.

F. Brown (25)
Ptarmigan Creek 115 G 6
1981 61° 18'N, 139° 11'W

This property is located along Ptarmigan Creek, approximately 1.3 km (.8 miles) upstream from its confluence with Duke River.

F. Brown worked at this site in 1981, using a backhoe, a small sluice box, and a 5 cm (2 inch) diameter pump.

C. Eikland (26)
C. Backstrom 115 G 6
Badlands Creek 61° 18'N, 139° 13'W
1981, 1982

This property is situated along Badlands Creek, just upstream from its confluence with Duke River.

C. Eikland and C. Backstrom mined at this location in 1981 and 1982 using a small John Deere bulldozer, and a backhoe.

VanBibber Placer Development (27)
Badlands Creek 115 G 6
1981, 1982 61° 18'N, 139° 14'W

This property is situated along the right limit of Badlands Creek, approximately 1.5 km (5000 feet) upstream from its confluence with Duke River. The deposits are not frozen. They consist of .3 to .5 metres (1 to 2 feet) of muck overlying 1.2 to 2 metres (4 to 6 feet) of coarse gravel.

Work on the property began in 1981, when testing was done with a D7 bulldozer and long tom. In 1982, 5 people mined with two D7 bulldozers. A "Ross" box capable of processing 75 cubic metres (100 cubic yards) per hour was used for sluicing. A small settling pond, and a water-return pond were constructed.

P. Temple (28)
Granite Creek 115 G 6
1981, 1982 61° 17'N, 139° 15'W

This property is located on Granite Creek, approximately .6 km (.4 miles) upstream from its confluence with Duke River.

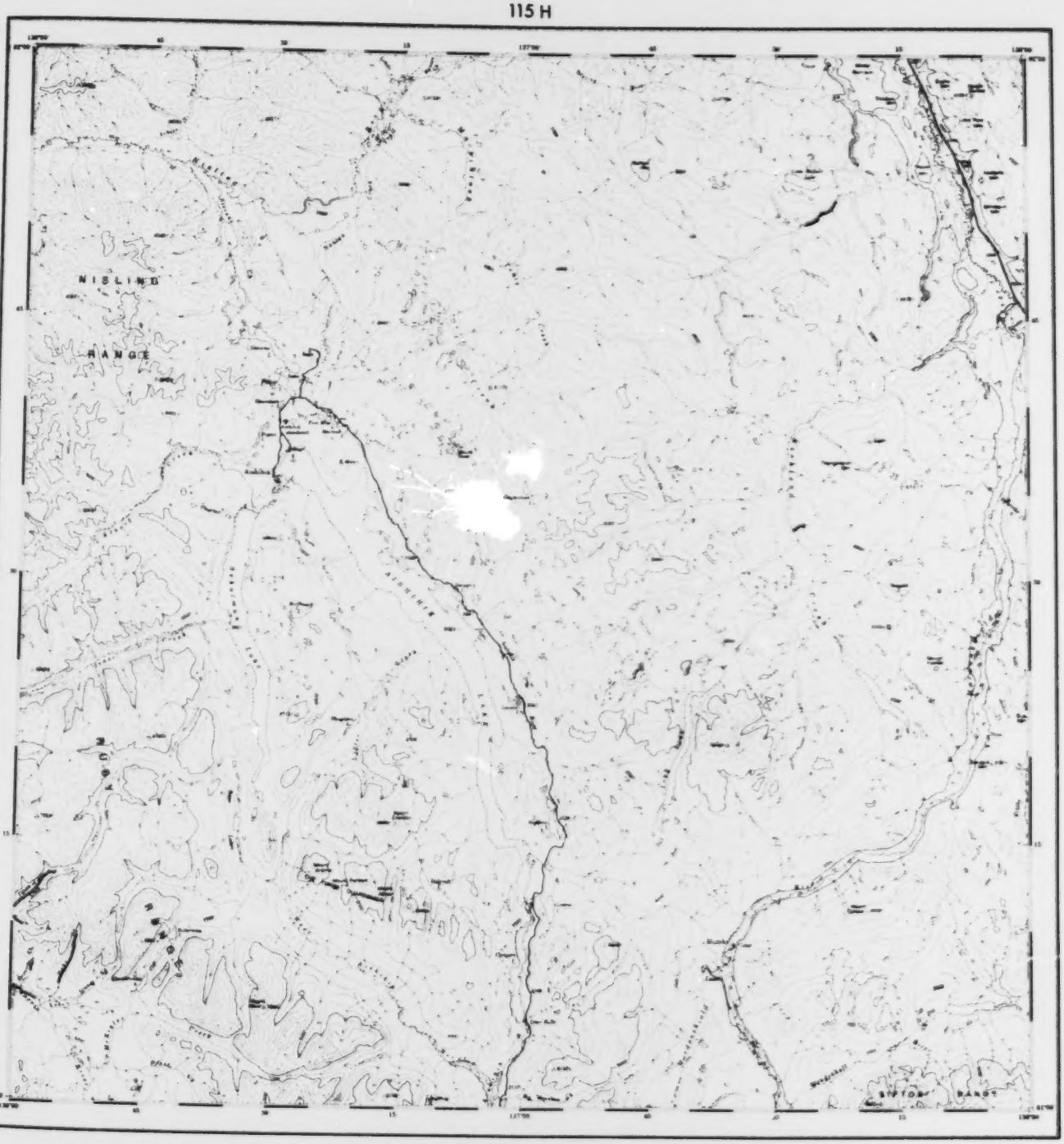
P. Temple mined small cuts at this site in 1981 and 1982, using a backhoe.

T. Churchill (29)
D.A.S. Co. Ltd. 115 G 1
Sikanni Oilfield Construction Ltd. 61° 11'N, 138° 05'W
Fourth of July Creek
1978, 1979, 1980,
1981, 1982

This property is located along the left limit of Fourth of July Creek, approximately 1.3 km (.8 miles) downstream from the mouth of Snyder Creek. Deposits at the site consist of .3 metres (1 foot) of muck overlying 3.5 to 6 metres (12 to 20 feet) or more of gravel.

Mining was begun at this location in 1978 by T. Churchill. He continued work in 1979 and 1980. Work in 1981 was done by D.A.S. Co. Ltd. Twelve people mined using a D6 and a D8 bulldozer, a 966 loader with 3 cubic metre (4 cubic yard) bucket, and a 235 backhoe with 1.1 cubic metre (1.5 cubic yard) bucket. A "Ross" sluice box with a capacity of 230 cubic metres (300 cubic yards) per hour was used to process the material mined. Water for sluicing was pumped by a 25 cm (10 inch) diameter electric pump. A diversion ditch 1,375 metres (4,500 feet) long was built to allow excess creek flow to bypass the settling ponds. Work at the property was done in 1982 by Sikanni Oilfield Construction Ltd. The D8 bulldozer and 235 backhoe were used by six people. Mining was done in the former creek bed of the area bypassed by the diversion ditch. Sluicing water was retained in seven small settling ponds.

115 H



HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983.

AISHIHIK LAKE
YUKON TERRITORY

5 0 5 10 15 20 25 30
KILOMETRES

115 I

HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983.
DOTS INDICATE PLACER MINING OPERATIONS ACTIVE DURING THE PERIOD 1979 TO 1982. NUMBERS BESIDE THE DOTS RELATE TO THE TEXT.

CARMACKS
YUKON TERRITORY

5 0 5 10 15 20 25 30
KILOMETRES

PLACER MINING OPERATIONS IN THE CARMACKS MAP AREA, NTS 115 I

K. Wilson (1)
R. Davy 115 I 6
Unnamed Creek 62° 21'N, 137° 22'W
1979

This property is situated on an unnamed right limit tributary of Big Creek which flows into Big Creek approximately 3.2 km (2 miles) upstream from Mechanic Creek.

A shaft 10.4 metres (34 feet) deep was dug at this location, and 1 to 1.2 metres (3 to 4 feet) of black muck were stripped from an area of approximately 2,800 square metres (30,000 square feet) in 1979. The deposits at the site are frozen.

B. McCauley (2)
Mechanic Creek 115 I 6
1980, 1981, 1982 62° 21'N, 137° 18'W

This property is situated on Mechanic Creek, approximately 350 metres (1,100 feet) upstream from its confluence with Big Creek. Deposits at the site are frozen.

B. McCauley mined part-time at this location in 1980, 1981, and 1982.

Guder Mining Exploration Ltd. (3)
Mechanic Creek 115 I 6
1982 62° 20'N, 137° 19'W

This property is situated on Mechanic Creek, approximately 1 km (.6 miles) upstream from its confluence with Big Creek.

Work at this location was begun in 1982 by three people who did ground preparation work and test mining.

R. Coles (4)
Mechanic Creek 115 I 6
1982 62° 20'N, 137° 19'W

This property is located on Mechanic Creek, approximately 1.9 km (1.2 miles) upstream from its confluence with Big Creek.

R. Coles mined part-time at this site in 1982.

K. Djukastein (5)
Revenue Creek 115 I 6
1978, 1979, 1980 62° 20'N, 137° 16'W
1981, 1982

This property is situated along Revenue Creek, approximately 1.1 km (.7 miles) from its confluence with Big Creek. The Revenue Creek valley is narrow, and has steep slopes. Deposits being mined range from 3.5 to 6 metres (12 to 20 feet) in thickness, and consist of 15 cm (6 inches) of volcanic ash overlying .5 metres (2 feet) of brown and grey fine silt, and 2.9 to 5.3 metres (9.5 to 17.5 feet) of interstratified sand, gravel, and black muck. Remains of mastodons, bisons, horses, and other animals have been found in the deposits, which are frozen. Bedrock is partially decomposed rusty weathering quartz-feldspar porphyry with abundant small quartz veinlets.

Work at this location was begun by K. Djukastein in 1978. He mined an area 15 to 24 metres (50 to 80 feet) wide, 122 metres (400 feet) long and averaging 3.5 metres (12 feet) deep using a D7E bulldozer, and a 966B loader. Using the same equipment in 1979, he mined an area 15 metres (50 feet) wide, 122 metres (400 feet) long, and averaging 5.8 metres (19 feet) deep. Little mining was done in 1980 due to litigation concerning ownership and mining rights on the property, although a "Derocker" designed by Mr. Djukastein to remove boulders from the gravel prior to sluicing was set up. He continued work using the same equipment in 1981 and 1982. A diversion ditch was constructed in 1981 to bring water for sluicing from Big Creek. Two settling ponds were also built.

Heavy minerals other than gold recovered at this site include magnetite, barite, and scheelite. The magnetite occurs as granular and bladed grains up to 5 cm (2 inches) in diameter. Some are lodestone.

K. Wilson (6)
F. Guder 115 I 6
J-Nor Enterpriese 62° 21'N, 137° 14'W
Happy Creek
1979, 1980, 1982

This property is located along Happy Creek approximately .8 km (.5 miles) upstream from its confluence with Big Creek. Happy Creek is the local name of the right limit tributary of Big Creek midway between Revenue and Seymour Creeks. There are old workings at this site. Deposits present consist of 2.5 metres (8 feet) of black muck overlying 2.5 metres (8 feet) of gravel.

K. Wilson and F. Guder attempted to mine at this location in September, 1979, but found that it was too late in the season for work to be done. They did assessment work in 1980. In 1982, J-Nor Enterprises mined a cut along the left limit using a D7E bulldozer and a backhoe. The material mined was sluiced in a 60 cm (24 inches) wide sluice box 14.6 metres (48 feet) long with gravity-fed water supplied from a holding pond. Water was recirculated when water levels were low. One recirculating pond and two settling ponds were used to impound sluicing water.

K. Wilson (7)
K. Djukastein 115 I 6
G. Wilson 62° 21'N, 137° 08'W
R. Bardwell
Stoddart Creek
1980

This property is situated along Stoddart Creek, approximately 2.9 km (1.8 miles) northeast of Mount Freegold. Permafrost at this location is discontinuous.

Four people worked on Stoddart Creek using a D7 bulldozer in 1980. They built approximately 6.5 km (4 miles) of road, sank two shafts, and mined a cut 21 metres (70 feet) wide and 91.5 metres (300 feet) long.

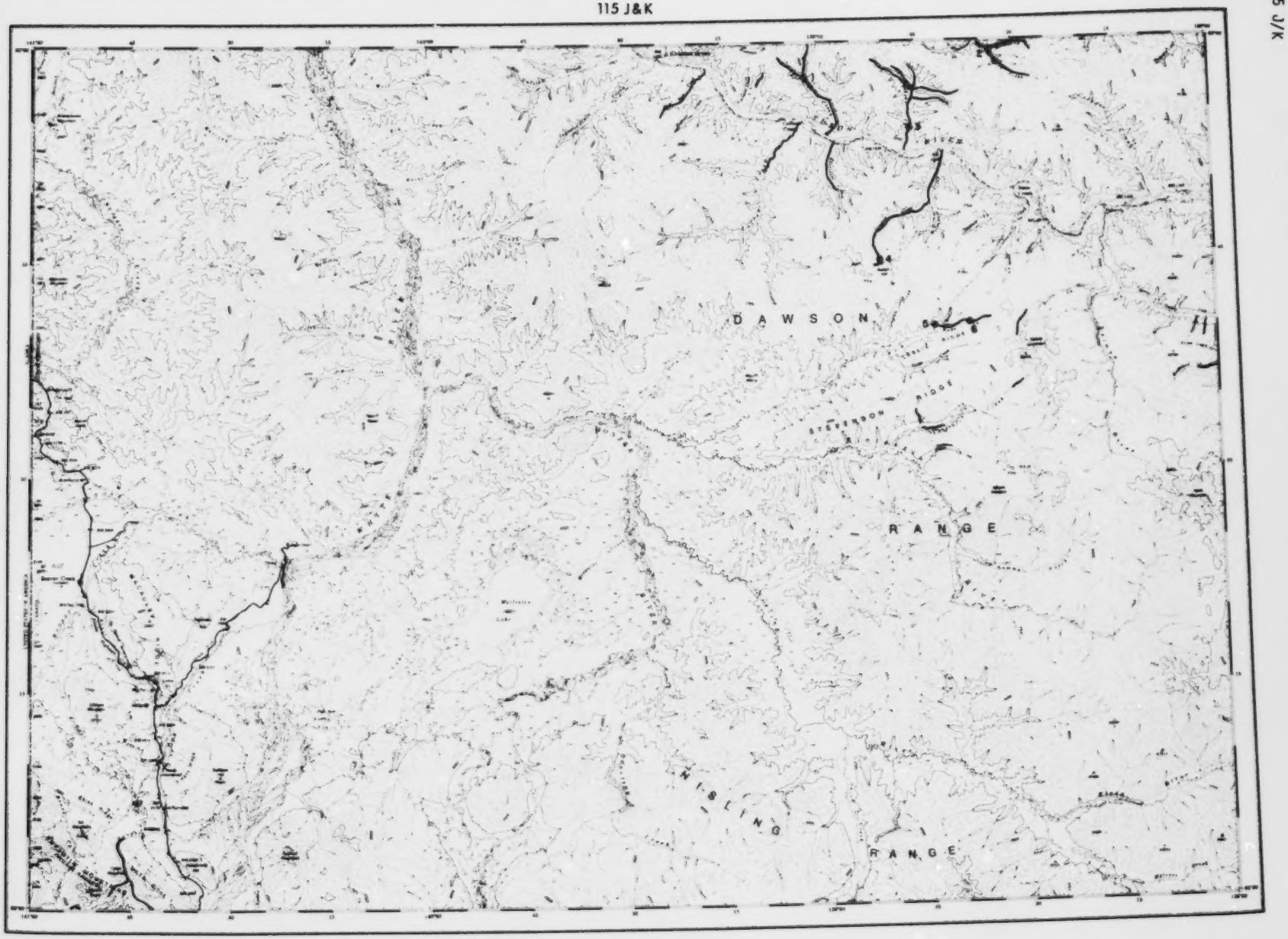
Gold recovered from Stoddart Creek was coarser grained than gold recovered from other creeks in the Big Creek area.

Ardill Construction Ltd. (8)
Nansen Creek 115 I 3
1980, 1981, 1982 62° 03'N, 137° 13'W

This property is situated along the right limit of the middle portion of Nansen Creek, opposite the mouth of Discovery Creek. Deposits present consist of a thin surface layer of gravel overlying .5 metres (2 feet) of muck and 5.5 metres (18 feet) of gravel. The deposits are frozen.

Test work was done at this location in 1980 using a backhoe, and in 1981 and 1982 using a D7 bulldozer.

NOTES



HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983.
DOTS INDICATE PLACER MINING OPERATIONS ACTIVE DURING THE PERIOD 1978 TO 1982. NUMBERS BESIDE THE DOTS RELATE TO THE TEXT.

SNAG
YUKON TERRITORY

5 0 5 10 15 20 25 30
KILOMETRES

PLACER MINING OPERATIONS IN THE SNAG MAP AREA, NTS 115 J/K

Van-Sea Investments Co. Ltd. (1)
Ballarat Creek 115 J 14
1981, 1982 62° 58'N, 139° 02'W

This property is situated along the right limit of Ballarat Creek, in an area which has not previously been mined. The section is 6 to 6.5 metres (20 to 22 feet) thick, and consists of 1.2 metres (4 feet) of black muck overlying 5 to 5.5 metres (16 to 18 feet) of gravel. Bedrock is schist and gneiss. The deposits are frozen.

Work on the property began in July 1981. A crew of 6 worked 2 shifts with a D8K and a D9H bulldozer, and a 235 backhoe. A cut some 7,250 square metres (78,000 square feet) in area containing 44,000 cubic metres (58,000 cubic yards) of material was mined. The lower 1.2 metres (4 feet) of gravel and a metre (3 feet) of bedrock were sluiced. A three channel "Pearson" sluice box was used. All water used for sluicing was recirculated. Mining was done on the property in 1982 using the same equiment as in 1981 and a crew of 6.

Magnetite and garnet are the major accessory minerals recovered. Gold from this locality is reported to have a fineness of 852.

Territorial Gold Placers Ltd. (2)
Mariposa Creek 115 J 15
Scroggie Creek 63° 00'N, 138° 34'W
1981

This property is situated on Mariposa Creek at its confluence with Scroggie Creek. Deposits at this location consist of 1.2 metres (4 feet) of black muck overlying brown gravel.

Twelve people worked at this property in 1981, using three D8 bulldozers, a 966 loader and a "Ross" sluice box.

Gold from Mariposa Creek appears well worn. It is reported to have a fineness of 900. In addition to gold, magnetite, abundant garnet, pyroxenite, and rarely, platinum were recovered by this mining operation. The garnet, pyroxenite, and platinum were probably derived from the pyroxenite of Pyroxene Mountain, at the headwaters of Mariposa Creek.

Atlantic Energy Corp. (3)
Pedlar Creek 115 J 15
1982 62° 54'N, 138° 46'W

This property is situated along Pedlar Creek, approximately 3 km (1.9 miles) upstream from its confluence with Yukon River. The stream has a gradient of 2% at this location. Deposits consist of .5 metres (2 feet) of black muck overlying 4.5 metres (15 feet) of gravel.

Test work was done in 1982. Two shafts 1.9 square metres (20 square feet) and a third 2.3 square metres (25 square feet) in area were dug.

P.J.J. Mining (4)
Can-Pat Explorations Ltd. 115 J 10
Canadian Creek 62° 45'N, 138° 51'W
Patton Gulch
1980, 1981, 1982

This property is situated at the headwaters of Canadian Creek in the vicinity of a small seasonal lode silver-lead mine, and a copper-molybdenum deposit. Placer gold was first recovered from Canadian Creek in 1911. Scheelite was recognized in 1915. Placer tungsten mining was attempted in 1941 at the site of the current operation. Deposits consist of .3 metres (1 foot) of muck overlying 2.5 to 6 metres (8 to 20 feet) of gravel. The gravel contains as much as 2 to 3% of magnetite as grains up to 10 cm (4 inches) in diameter, and abundant grains of hematite up to 5 cm (2 inches) in diameter.

A crew of 6 worked on two shifts in 1980 with two International TD 25 bulldozers, and two loaders with 1.5 and 2.3 cubic metre (2 and 3 cubic yard) buckets during 1980. Two cuts totalling approximately 4,500 cubic metres (6,000 cubic yards) were mined. All material coarser than 4 cm (1.5 inches) was removed by grizzly and screen prior to sluicing. Problems were encountered, however, with the abundant magnetite and hematite present plugging the riffles in the 60 cm (24 inch) wide sluice box. Water for sluicing was obtained from a small holding pond. The amount of water available was too limited to allow use of a larger sluice box, or more water for sluicing. Material was mined from Canadian Creek and from Patton Gulch in 1981. Three holding ponds provided water for sluicing. Three settling ponds were constructed. In 1982, a fourth settling pond was added. Three International TD 25 bulldozers and two loaders were used for mining. A "Panomatic" shaking table was used each year to separate the valuable minerals from others in the sluice box concentrates.

Gold recovered from the property is mostly fine-grained. Some is flat, and some is wiry. Heubnerite (wolframite) and scheelite are also recovered.

Gold Creek Mining Ltd. (5)
Rude Creek 115 J 10
Dip Creek 62° 40'N, 138° 43'W
1981

This property is situated in the broad valley at the confluence of Rude and Dip Creeks.

Test work and stripping were done in 1981. A settling pond was constructed, but little sluicing was done.

Gold Creek Mining Ltd. (6)
Rude Creek 115 J 10
1980, 1981 62° 40'N, 138° 39'W

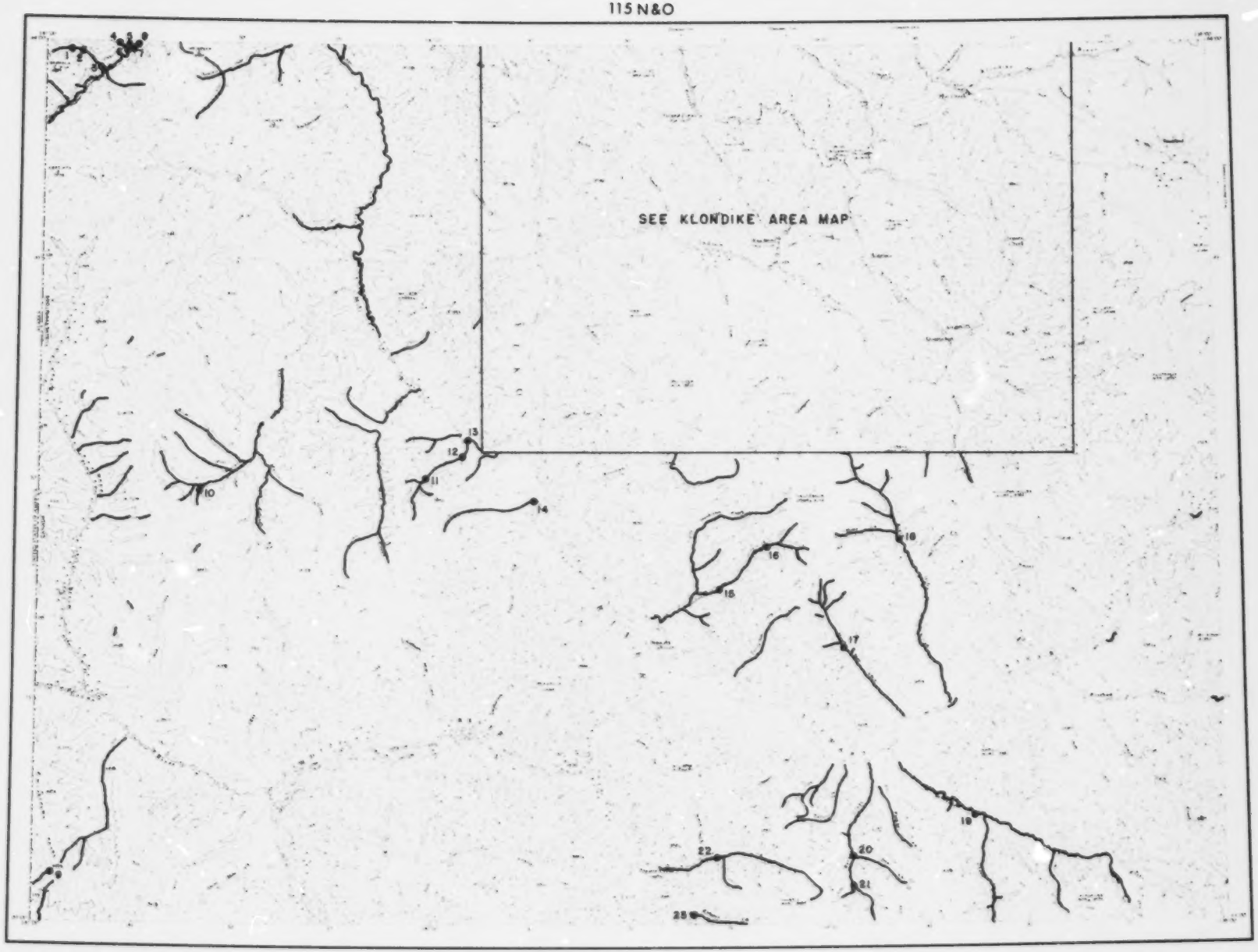
This property is situated along the middle portion of Rude Creek, approximately 9 km (5.6 miles) northwest of

Mount Cockfield. The creek has a shallow gradient at this location, and is in a broad valley with gentle slopes. Deposits present consist of 1 metre (3 feet) of black muck overlying 2.5 to 3.5 metres (8 to 12 feet) of gravel with very coarse boulders up to 120 cm (48 inches) in diameter. Only the lower 1 to 2 metres (3 to 6 feet) of the deposits are frozen. Bedrock is rusty weathering quartz-feldspar porphyry which is badly decomposed to a depth of 1.2 metres (4 feet). Old workings are present in the area.

Ten people worked on two shifts mined using two D8K bulldozers and a 980C loader with 4.6 cubic metre (6 cubic yard) bucket in 1980. The material mined was processed over a "Derocker" to remove the coarse boulders prior to sluicing in a 1.5 metre (5 feet) wide sluice box 7.3 metres (24 feet) long. Water for sluicing was recirculated from a 30 by 180 metre (100 by 600 feet) holding pond below a 15 by 30 metre (50 by 100 feet) settling pond. Three cuts of approximately 4,500 square metres (50,000 square feet) each were mined in 1980. Ten people continued work at this site for part of the 1981 season, using the same equipment as in 1980.

In addition to gold, magnetite and limited amounts of scheelite were recovered by Gold Creek Mining Ltd. The magnetite was abundant. Granular aggregates of magnetite up to 5 cm (2 inches) in diameter were recovered. Any coarser aggregates would have been removed by the "Derocker" prior to sluicing.

NOTES



HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983.
DOTS INDICATE PLACER MINING OPERATIONS ACTIVE DURING THE PERIOD 1978 TO 1982. NUMBERS BESIDE THE DOTS RELATE TO THE TEXT.

STEWART RIVER
YUKON TERRITORY

5 0 5 10 15 20 25 30
KILOMETRES

PLACER MINING OPERATIONS IN THE STEWART RIVER MAP AREA, NTS 115 O/N

B. Stone (1)
Bedrock Creek 115 N 15
1978, 1979, 1980 63° 59'N, 140° 56'W
1981, 1982

This property is located on Bedrock Creek, approximately 3 km (2 miles) from the Alaska boarder. The strata comprising the section are discontinuous and of variable thickness. The bedrock surface is very irregular, with relief of 9 metres (30 feet) in places. The total thickness of the section is subsequently also very variable. One measured section 5.5 metres (18 feet) thick consisted of 2 metres (6 feet) of black muck overlying .5 metres (2 feet) of gravel and discontinuous woody muck, 1 metre (3 feet) of fine sand with irregular gravel lenses, .5 metres (2 feet) of dry, woody muck, and 1.5 metres (5 feet) of gravel. These features record the positions of a series of ancient stream channels which cut bedrock, or previously existing alluvial deposits.

Shafts on the property were dug by early miners, likely during the 1890's. Piles of rocks stacked by hand and a ditch which brought water for sluicing from a resevoir on the Alaskan side of the border are remnants from these early mining ventures. A narrow cut was mined from the centre of the valley on the property by J. Lamontagne during the 1950's.

Mr. Stone began work at this site in 1976. During 1978, he mined along the left limit using an HD6G Allis Chalmers loader and a 977 loader. The section was 3.5 metres (11 feet) thick and consisted of 1 metre (3 feet) of black muck overlying 2.5 metres (8 feet) of gravel. Work continued with the same equipment in 1979, when a water reservior, and three settling ponds were constructed. When available, gravity-fed water was used for sluicing. Otherwise, water was recirculated by pump from the settling ponds. The same equipment was used at this site in 1980. In 1981, a D8H bulldozer and a 950 loader were used. Mining continued during 1982. Two D8H bulldozers, and a 950 loader were used.

S. Prohaska (2)
Bedrock Creek 115 N 15
1978, 1979, 1980 63° 59'N, 140° 54'W
1981, 1982

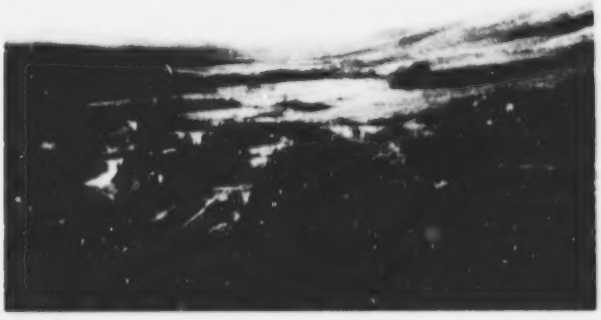
This property is situated on Bedrock Creek, approximately 5 km (3 miles) east of the Alaska border. Shafts on the property were dug by early miners, likely during the 1890's. The section at this site is approximately 3 metres (10 feet) thick, and consists of a jumble of angular quartzite and quartz-biotite schist fragments with a few cm (inches) of gravelly muck and wood fragments overlying 2.5 metres (9 feet) of rusty gravel. Bedrock at the site is badly decomposed.

Mr. Prohaska began work on the property in 1977. In 1978, he mined an area of approximately 30 by 45 metres (100 by 150 feet). During 1979, he worked with 2 employees using a D7 and a D7E bulldozer, and a Drott backhoe. He continued work during 1980, 1981 and 1982 using the same equipment, and with the help of one or two employees. The material mined during 1982 was tailings from earlier mining operations.

M. Kirkman (3)
Sixty Mile River 115 N 15
1979 63° 58'N, 140° 52'W

This property is situated along the left limit of Sixty Mile River at the mouth of Bedrock Creek.

M. Kirkman mined at this property in 1979.



View to the southwest, upstream along Sixty Mile River from the mouth of Bedrock Creek. The Alaska-Yukon border is in the distance.

W. Yaremcio (4)
Territorial Gold Placers Ltd. 115 N 15
Capital Dynamics 64° 00'N, 140° 49'W
Miller Creek
1978, 1979, 1980
1981, 1982

This property is situated along Miller Creek, approximately 1.8 km (1.1 miles) upstream from its confluence with Sixty Mile River. Deposits in two different settings are being worked at this location. One setting is in the present creek valley. Miller Creek was dredged in 1914, 1915, 1916, and 1917. Strips of unmined gold-bearing gravel remain, however, along either side of the dredged area. The undisturbed deposits consist of 2.5 to 10.5 metres (8 to 35 feet) of black muck overlying 2.5 metres (8 feet) of gravel. The muck layer is thickest along the right limit of the creek, where the valley wall is steep. The other setting is in an old channel of Miller Creek situated approximately 60 metres (200 feet) from the present channel on a left limit bench. The two channels are separated by a ridge of bedrock. Deposits in the old channel consist of approximately 9 metres (30 feet) of poorly sorted, matrix supported gravel in 6 cycles, each of

which grades from gravel at the base to mostly sand at the top, overlying 2.5 metres (8 feet) of sandy gravel. The sandy gravel of the lower unit is gold-bearing; the poorly sorted gravel is not. Bedrock in the area is badly decomposed rusty weathering Eocene andesite.

W. Yaremcio and one helper mined deposits of the old channel on the left limit bench in 1978. They stripped approximately 9 metres (30 feet) of barren gravel from an area of 1,200 square metres (13,000 square feet), and sluiced approximately 1,900 cubic metres (2,500 cubic yards) of gold-bearing gravel from the bottom 1.5 metres (5 feet) of the section. In 1979, two peopled worked with the D7 bulldozer and a 966C loader in a cut along the left limit of the dredge tailings in the present channel of Miller Creek. Mr. Yaremcio continued work in 1980. The property was taken over in 1981 by Territorial Gold Placers Ltd. Twelve people worked on two shifts using two D8 bulldozers, a 966 loader, a 235 backhoe, and a "Ross" sluice box to mine and process deposits from the old channel. Capital Dynamics took over the property in 1982. Fourteen people worked on two shifts, using the same equipment as in 1981. They enlarged the pit on the left limit bench, and stripped and mined four long narrow cuts along the right and left margins of the dredge tailings in the present channel of Miller Creek. The cuts in the present channel total approximately 25,000 square metres (270,000 square feet) in area.

In addition to gold, magnetite and minor amounts of scheelite and cinnibar are recovered from the deposits of both the old and new channels at this location. The cinnibar does not appear very worn. Gold from Miller Creek is reported to have a fineness of 827 to 857.

Chumar Placers **(5)**
Miller Creek **115 N 15**
1981, 1982 **64° 00'N, 140° 48'W**

This underground mining operation is situated along the left limit of Miller Creek, approximately 1 km (.6 miles) upstream from its confluence with Sixty Mile River. Deposits at this site occupy an old channel of Miller Creek on the left limit of the present channel, and separated from it by a ridge of bedrock approximately 100 metres (330 feet) wide. The deposits are approximately 29 metres (95 feet) thick, but only those in the lowermost 3 metres (10 feet) are gold bearing.

Three people began mining at this property in 1981 after test shafts sunk by F. Chudy established the presence of gold-bearing gravel. An adit was driven to the east through the bedrock ridge from the present creek valley to the old channel. Bedrock was drilled and blasted, and removed by small diesel-powered scoop trams. Work continued in the winter of 1981. Gravel from the base of the old channel was drilled, blasted, and removed to a stockpile. The work was done in the winter to ensure that the remaining frozen gravel did not thaw, and hence remained competent enough to support itself. The stockpiled gravel was sluiced during the summer, while the workings were closed and sealed. Mining continued during the winter of 1982, with a larger crew.

Brisebois Brothers Construction Ltd. **(6)**
Miller Creek **115 N 15**
1982 **64° 00'N, 140° 48'W**

This property is situated along the left limit of Miller Creek approximately .6 km (.4 miles) from its confluence with Sixty Miler River. Deposits at this location consist of gold-bearing gravel deeply buried by barren gravel in an old channel of Miller Creek.

Work at this site was begun in 1982. Two D9 bulldozers, a Case 1150 bulldozer, and a 992 loader were used for part of the season to strip a large area of barren gravel in preparation for future mining operations.

Brisebois Brothers Construction **(7)**
Sixty Mile River **115 N 15**
1978, 1979, 1980 **64° 00'N, 140° 47'W**
1981, 1982

C. Brisebois at his cut along the left limit bench of Sixty Mile River. Colluvium at the top of the cut is slightly darker than the underlying gravel and silt horizons. The layer immediately above bedrock, which is mostly hidden by stockpiles of gravel in this photograph, is gold-bearing.

This property is situated on a left limit bench of Sixty Mile River, approximately .8 km (.5 miles) downstream from the mouth of Miller Creek. Deposits consist of several discontinuous units of variable thickness totalling 11.6 to 18.3 metres (38 to 60 feet). The section is comprised of 2 to 2.5 metres (6 to 8 feet) of colluvium overlying .6 metres (2 feet) of black muck, 7.8 to 13.4 metres (26 to 44 feet) of poorly sorted, matrix supported barren gravel in 5 cycles, each of which fines upwards to silt, and in some cases organic matter, and which may in part be truncated by the overlying cycle, and a 1.2 to 1.8 metre (4 to 6 feet) thick section of gold-bearing brown gravel at the base of the section. Ice wedges are present in the gravel. Bedrock is Eocene andesite and andesite tuff breccia with clasts of 10 cm (4 inches) in diameter. Bedrock is badly decomposed.

Work at this location was done in 1978 by three people using two D8 and one D9 bulldozer. Approximately 23,000 cubic metres (30,000 cubic yards) of material were mined from a 1,850 square metre (20,000 square feet) area. Water for sluicing was obtained from the Miller Creek - Sixty Miller River diversion ditch. Dredge ponds and dredge tailings were used as settling ponds for the sluicing water. Mining continued in 1979 and 1980. Two D9 bulldozers, a Case 1150 bulldozer, and a 992 loader with 7.6 cubic metre (10 cubic yard) bucket were used. Five people mined approximately 34,000 cubic metres (45,000 cubic yards) of material in 1981, using the same equipment as in previous years. Work continued in 1982 when the same equipment was used to mine a cut approximately 9 metres (30 feet) wide, 245 metres (800 feet) long, and 18 metres (60 feet) deep. Stripping of the colluvium, black muck, and barren gravel was done on two shifts to allow the material to thaw enough so that it could be easily removed, but not so much that equipment could be mired in it. A 1.2 metre (4 feet) wide sluice box 9.8 metres (32 feet) long was used to wash the lowermost gravel unit. Clay in the gravel made efficient processing difficult.

M. Brisebois **(8)**
Sixty Mile River **115 N 15**
Miller Creek Ditch **64° 00'N, 140° 47'W**
1981, 1982

This property is located on a left limit bench of Sixty Mile River, approximately 1.6 km (1 mile) downstream from the mouth of Miller Creek. Deposits at this site differ from those at the immediately adjacent property of Brisebois Brothers Construction Ltd. Stream action has cut through most of the thick section of poorly sorted gravel, and the channel has subsequently filled with other deposits. The section consists of 2 to 2.4 metres (6 to 8 feet) of colluvium, overlying 11 metres (36 feet) of black muck, 1.5 metres (5 feet) of cross-bedded and channelled sandy gravel, a one metre (3 feet) thick remnant of the poorly sorted gravel, and 1.2 to 1.8 metres (4 to 6 feet) of gold-bearing brown gravel. The bedrock is again badly decomposed andesite and andesite tuff breccia.

Three people worked at this property in 1981 using a D9G bulldozer, and a 988 loader with 4.6 cubic metre (6 cubic yard) bucket. They stripped approximately 38,000 cubic metres (50,000 cubic yards) of material, and sluiced an additional 11,500 cubic metres (15,000 cubic yards) through a one metre (3 foot) wide sluice box 9.8 metres (32 feet) long. Sluicing water was settled in a 60 metre (200 feet) square pond 1.2 metres (4 feet) deep. Work continued at the property in 1982, with four people using 2 D9G bulldozers and the 988 loader. Approximately 15,000 cubic metres (20,000 cubic yards) of material were stripped, and an additional 5,500 cubic metres (7,000 cubic yards) were sluiced. The capacity of the settling pond was greatly increased.

Claymore Resources Ltd. **(9)**
Goldwin Joint Venture
Kenyon Creek **115 N 2**
1978, 1979, 1980 **63° 03'N, 140° 57'W**
1981, 1982

This property is situated along a creek known locally as Kenyon Creek. Kenyon Creek drains the western side of the south end of the Moosehorn Range. The property is only 4.8 km (3 miles) from the Alaska-Yukon border. Deposits at this location consist of .6 to 1.8 metres (2 to 6 feet) of black muck overlying 1.8 metres of grey sandy gravel. Bedrock is granodiorite. A mantle of residual soil covers the bedrock. A detailed description of the geology of the area, and of lode and placer gold deposits there is given by J.A. Morin in the D.I.A.N.D. Yukon Mineral Industry Report for 1976.

Work in 1978 was done on two shifts using two Terex bulldozers and a 980B loader. Mining was done on both the north and south forks of Kenyon Creek for part of the season, and on the south fork only for the other part. Deposits on the north fork were not as high grade as those of the south fork, but conditions there allowed for processing material at a faster rate. Approximately 65,000 cubic metres (85,000 cubic yards) of material were stripped, and a similar amount was sluiced. There were 139,500 gm (4,489 ounces) of crude gold recovered. A large reservoir to hold water for sluicing, and settling ponds were built in 1978. In 1979, Claymore Resources Ltd. leased the property to Goldwin Joint Venture. Five people mined, using the Terex bulldozers and 980B loader, and a three channel sluice box. Goldwin Joint Venture continued mining at the property with six employees in 1980, 1981, and 1982.

Gold from the Moosehorn Range is reported to have a fineness of 820, but gold from this property has a fineness of 773. Most is in the fine to coarse sand range of grain sizes.

Claymore Resources Ltd. carried out exploration of deposits in creeks on the east side of the Moosehorn Range opposite Kenyon Creek during 1981. Six churn drills totalling 126.5 metres (415 feet) were drilled along 9.6 km (6 miles) of creek. Gold values were found to decrease downstream.

Goldmark Minerals **(10)**
Matson Creek **115 N 7**
1979, 1980 **63° 29'N, 140° 36'W**
1981, 1982

This property is situated along a right limit tributary near the headwaters of Matson Creek. The tributary flows

into Matson Creek approximately 6.6 km (4.1 miles) upstream from the mouth of Borden Creek. Gold was discovered on Matson Creek in 1911. The creek and its tributaries were staked from end to end that year. Placer deposits near the site of the original discovery were worked by Mr. J. Matson, after whom the creek was named, from 1911 until his death in 1942. Mr. Matson's workings are located on the current Goldmark Minerals property. Deposits at the site, which is in a broad valley with gentle slopes, consist of 1.2 to 4.6 metres (4 to 15 feet) of black muck overlying 0 to 3 metres (0 to 10 feet) of gravel. Bedrock is quartzite, sericitic and graphitic schist, biotite gneiss, and felsic dike rocks. All are deeply weathered.

Twelve people worked at the property in 1979 using two D8 bulldozers, and a loader with 4.2 cubic metre (5.5 cubic yard) bucket. Stripping was done on one shift, and sluicing was done on two shifts. One long narrow cut of approximately 350 square metres (3,750 square feet) was mined in tailings at Matson's former workings. Most work was, however, done approximately 5 km (3 miles) downstream from Matson's former workings. Five cuts totalling approximately 1,850 square metres (20,000 square feet) were mined. Work continued in 1980, when ten people mined using two D8K and one D9H bulldozers, and two 980C loaders. They did a small amount of mining at Matson's former workings, and mined 3 cuts totalling approximately 4,500 square metres (48,500 square feet) in area at the main workings. A reservoir to impound water for sluicing was constructed on a right limit tributary of the creek opposite the main workings. Work continued in 1981, when 5 people mined using three pieces of equipment, and in 1982 when a cut of approximately 10,000 square metres (110,000 square feet) was mined.

Gold recovered from the site of Matson's former workings was fine grained, flat, and appeared well worn, while gold from the main workings was coarser, more equant, and less worn looking. Gold from Matson Creek is reported to have a fineness of 776.

Frazer Resources Ltd. (11)
Ten Mile Creek 115 N 9
1981, 1982 63° 30'N, 140° 01'W

This property is situated along the middle portion of Ten Mile Creek, at the mouth of Flume Creek. Deposits at this location consist of 1.8 to 2.4 metres (6 to 8 feet) of black muck overyling 4.9 metres (16 feet) of gravel.

Work was begun by Frazer Resources Ltd. in 1981. Fourteen people worked on two shifts, using one D8K bulldozer, one International TD-24 bulldozer, a 988C loader with 3.8 cubic metre (5 cubic yard) bucket, and an Elmac 250 loader with 2.3 cubic metre (3 cubic yard) bucket to mine along the left limit of the creek. Gravel was sluiced in a "Pearson 500" sluice box. Water for sluicing was gravity-fed from a reservoir remaining from earlier mining operations at the site, and recirculated from the one large and two small settling ponds built in 1981. Work continued in 1982, when eight people used the same equipment as in 1981 plus a D8H bulldozer. A "Derocker" was installed over the dump box of the sluice to remove grains coarser than 5 cm (2 inches) in diameter prior to sluicing.

N.B. Cook Corp. (12)
Ten Mile Creek 115 O 12
1978, 1979, 1980 63° 32'N, 139° 55'W
1981, 1982

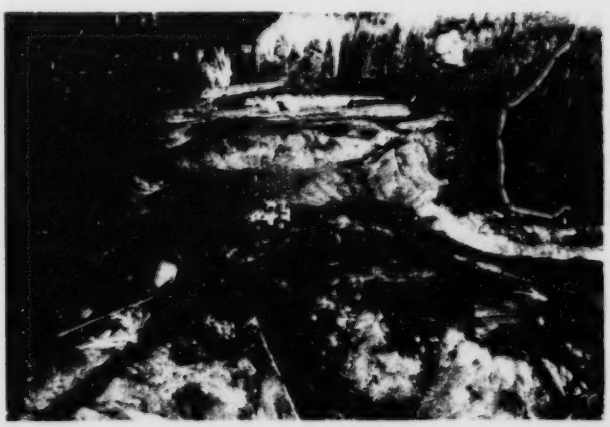
This property is situated along Ten Mile Creek, approximately 1.6 km (1 mile) upstream from its confluence with Sixty Mile River. Deposits consist of 1.5 metres (5 feet) of overburden overlying 2.1 metres (7 feet) of gravel with angular clasts. Adits from former underground mining operations are present along the right limit of the creek from the second to eighth claim above its mouth, and again upstream from the fourteenth claim above its mouth.

N.B. Cook Corp. employed 13 people at this property in 1978. They mined using three D8 bulldozers and a 980 loader with 3.8 cubic metre (5 cubic yard) bucket. Test drilling of bench deposits at 15 metre (50 feet) centres on lines 30 metres (100 feet) apart was done using a 10 cm (4 inches) diameter churn drill. Work continued in 1979. The same equipment was used to strip approximately 28,000 cubic metres (37,000 cubic yards) of material, and mine an additional 65,000 cubic metres (85,000 cubic yards) for sluicing. Eleven people worked using three D8K bulldozers and two 980C loaders in 1980. They mined, and constructed three settling ponds. A "Ross" box was used for sluicing. Work continued with the same equipment in 1981 and 1982. Two additional settling ponds, and a water recirculation pond were built in 1982.

Gold from Ten Mile Creek is reported to have a fineness of 830 to 845.

RPM Mining (13)
Sixty Mile River 115 O 12
1980, 1981 63° 33'N, 139° 55'W

RPM Mining worked on two left limit benches of Sixty Mile River opposite, and approximately 2.5 km (1.6



View of RPM Mining workings along the left limit bench of Sixty Mile River. The pipeline leading to the sluice box is in the foreground of the picture. The sluice box is at left.

miles) downstream from the mouth of Ten Mile Creek. Deposits consisted of .2 to 4.3 metres (.5 to 14 feet) of sandy gravel deposited on the downstream side of meanders, and abandoned on the benches when Sixty Mile River eroded bedrock to lie at a lower elevation.

Four people worked on these bench deposits in 1980 and 1981 using a D7 bulldozer, a 966 loader, and a narrow sluice box 15 metres (50 feet) long. The gold recovered was extremely fine grained.

W. Trerice **(14)**
L. Johnson **115 O 5**
Sestak Creek **63° 29'N, 139° 45' W**
1978, 1979, 1980
1981, 1982

This property is situated along Sestak Creek, approximately 2 km (1.3 miles) from its confluence with Yukon River. Sestak Creek is the left limit tributary of Yukon River midway between Excelsior Creek and Sixty Mile River. Deposits at this location consist of an irregular layer of black muck which averages 1.2 metres (4 feet) in thickness overlying 3.5 metres (12 feet) of gravel. Only the lowermost 2 metres (6 feet) of gravel are sluiced. The gold-bearing portion of the section appears to lie approximately .6 metres (2 feet) above bedrock. The bedrock surface is uneven.

W. Trerice began work at this site in 1978. Three people worked using a D8 bulldozer. Work continued in 1979. L. Johnson took over the property in 1980, and mined in 1980, 1981, and 1982.

Territorial Gold Placers Ltd. **(15)**
Henderson Creek **115 O 6**
1978, 1979, **63° 23'N, 139° 16'W**
1980, 1981

This property is located along the middle portion of Henderson Creek, approximately 3.8 km (2.4 miles) upstream from its confluence with North Henderson Creek. Deposits at the site consist of dredge tailings from dredging operations between 1949 and 1956, and 1.2 to 2 metres (4 to 6 feet) of black muck overlying 1.2 to 2 metres (4 to 6 feet) of brown sandy to clayey clast supported gravel with flat clasts up to 15 cm (6 inches) in diameter. Bedrock is quartz-biotite gneiss. It was not decomposed where exposed in 1980, although decomposed bedrock was reported elsewhere on Henderson Creek.

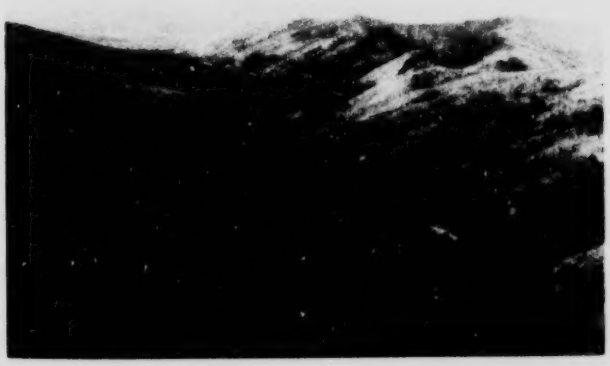
Work was done on this property in 1978, 1979, 1980, and 1981 by a crew of eight working on two shifts with three D8 bulldozers. The same crew also worked part of each season on Territorial Gold Placers Ltd.'s other Henderson Creek property. In 1979, 106,200 gm (3,414 ounces) of crude gold were recovered from 67,300 cubic metres (88,000 cubic yards) of material mined at both operations. In 1980, more than 127,500 gm (4,100 ounces) of crude gold were recovered from 13 cuts totalling 20,500 square metres (220,000 square feet) in area at both operations. A modified "Ross" sluice box with a capacity of 120 cubic metres (160 cubic yards) of material per hour was used to process the gravel in 1981. Territorial Gold Placers Ltd. went into receivership prior to the 1982 mining season, and so did not operate at this site in 1982.

Gold from this location is reported to have a fineness of 775. It is more pure, and also finer grained than gold recovered from the Territorial Gold Placers Ltd. operation approximately 8 km (5 miles) upstream from this one.

Territorial Gold Placers Ltd. **(16)**
Henderson Creek **115 O 6**
1978, 1979 **63° 26'N, 139° 10'W**
1980, 1981

This property is situated along the upper portion of Henderson Creek, approximately 11.8 km (7.4 miles) upstream from its confluence with North Henderson Creek, and approximately 5.6 km (3.5 miles) upstream from the upper limit of dredging done between 1949 and 1956.

Work was done on this property in 1978, 1979, 1980, and 1981 by a crew of eight working on two shifts with three D8 bulldozers. The same crew also worked part of each season on Territorial Gold Placers Ltd.'s other Henderson Creek property. In 1979, 106,200 gm (3,414 ounces) of crude gold were recovered from 67,300 cubic metres (88,000 cubic yards) of material mined at both operations. In 1980, more than 127,500 gm (4,100 ounces) of crude gold were recovered from 13 cuts totalling 20,500 square metres (220,000 square feet) in area at both operations. A modified "Ross" sluice box with a capacity of 120 cubic metres (160 cubic yards) of material per hour was used to process the gravel in 1981. Territorial Gold Placers Ltd. went into receivership prior to the 1982 mining season, and so did not operate at this site in 1982.



View of Henderson Creek, looking downstream from the workings of Territorial Gold Placers Ltd. toward Yukon River. The present creek has incised a narrow valley through unconsolidated colluvium, and possibly, older stream deposits.

Gold from this location is reported to have a fineness of 720. It is less pure, but coarser grained than gold recovered from the Territorial Gold Placers Ltd. operation approximately 8 km (5 miles) downstream from this one.

Maisy May Mines (17)
Maisy May Creek 115 O 7
1980, 1981, 1982 63° 19'N, 138° 58'W

This property is situated on Maisy May Creek, approximately 11.7 km (7.3 miles) upstream from its confluence with Stewart River. The Maisy May Creek Valley is broad, with gentle slopes and a shallow gradient in this area. The valley has constrictions at several places along its course, and so alternatives between wide and narrow. Deposits consits of 1.2 to 1.5 metres (4 to 5 feet) of black muck overlying 2 metres (6 feet) of gravel. The gold is distributed through the full thickness of the gravel. Bedrock is blocky weathering schist.

Work at this site was begun in 1980. Seven people using a D8H bulldozer, and D8K bulldozer, a D9H bulldozer, and a 980C loader with 3 cubic metre (4 cubic yard) bucket stripped black muck from an area 120 metres (400 feet) wide and 365 metres (1,200 feet) long, and mined a smaller area. A sluice box 1.5 metres (5 feet) wide and 13.4 metres (44 feet) long was used to process the gravel, and the uppermost .6 metres (2 feet) of bedrock at a rate of approximately 75 cubic metres (100 cubic yards) per hour. A reservoir with a capacity of 2,272,500 litres (500,000 gallons) was constructed to hold sluicing water for settling and recirculation. Work continued in 1981, and 1982 with 5 people mining using a D7 bulldozer and a D9H bulldozer.

Gold from Maisy May Creek occurs as tabular grains which appear worn. Magnetite and other heavy minerals are not abundant.

Territorial Gold Placers Ltd. (18)
Queenstake Resources Ltd. 115 O 7
Black Hills Creek 63° 26'N, 138° 49'W
1978, 1979
1980, 1981

This property extends downstream approximately 1.5 km (one mile) along the valley of Black Hills Creek from just above its confluence with Dome Creek. Deposits in the creek valley consist of 1 metre (3 feet) of organic rich muck underlain by 2 metres (6 feet) of closely packed and poorly sorted gravel with sandy to earthy matrix. The entire thickness of gravel was sluiced. Bedrock is blocky weathering foliated fine-grained quartzite. It is not decomposed. One to 1.2 metres (3 to 4 feet) of bedrock were mined and sluiced. The deposits are frozen.

Territorial Gold Placers Ltd. began work at this location in 1975. The company camp on Black Hills Creek housed management and mechanical personel involved in work on all company properties. Those employees are indicated as being employed at this site although their work was done at a number of sites.

During 1978, two D8 bulldozers were used to mine at this location. In 1979, four D8 bulldozers were used. A second sluice box was set up, and two independent mining operations about 1 km (.6 miles) apart were active on the property. One was on a right limit bench approximately 12 metres (40 feet) above the valley bottom. The D8 bulldozers were used in pairs, of which one mined the gravel and pushed it to a stockpile at the sluice box, while the other pushed the gravel into the sluice box. Three channel "Ross" sluice boxes capable of processing approximately 75 cubic metres (100 cubic yards) of material each hour were used. Approximately 76,000 cubic metres (99,500 cubic yards) of material were processed in 1979. There were 92,450 grams (2,972 ounces) of crude gold recovered. Two independent mining operations were again active on the property in 1980. One was situated just above Dome Creek, while the other was approximately 1.5 km (one mile) below Dome Creek. Two D8K bulldozers and a modified "Ross" sluice box capable of processing approximately 95 cubic metres (125 cubic yards) of material per hour were used at each operation. Stripping

View looking upstream of the area mined by Territorial Gold Placers Ltd. along Black Hills Creek.

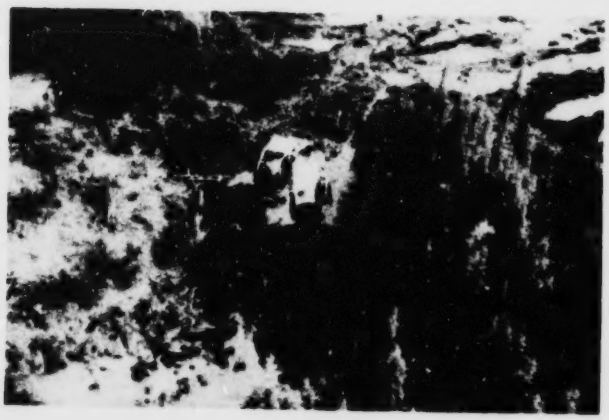
was done on two 10 to 12 hour shifts per day, while sluicing was done on one. There were 24 employees working at various tasks on the property. Gold production from this property in 1980 was more than 124,500 grams (4,000 ounces). Work on Black Hills Creek in 1981 was done at one site on the property using 3 D8 bulldozers and a modified "Ross" sluice box. Stripping was done on two shifts per day, while sluicing was done on one. There were 28 employees on the property. Territorial Gold Placers Ltd. went into receivership prior to the 1982 mining season, and did not operate in 1982. Queenstake Resources Ltd. acquired the property in September 1982, and conducted a program of pit sampling. Reserves for the property were calculated to be 760,000 cubic metres (1,000,000 cubic yards) of material containing .61 grams per cubic metre (.015 ounces per cubic yard) of gold.

The grain size of gold recovered from Black Hills Creek is reported to decrease as one proceeds downstream, while the fineness of the gold remains constant at 755.

H. Axel (19)
Scroggie Creek 115 O 2
1980, 1981 63° 07'N, 138° 39'W

This property is situated along the left limit of Scroggie Creek, approximately 1.3 km (.8 miles) downstream from its confluence with Walhalla Creek.

Three or four people worked at this property using two D8 bulldozers during parts of the 1980 and 1981 mining seasons. Black muck was stripped from a large area on a left limit bench in 1980, and some test mining was done. Work in 1981 was done on the bench as well as in the valley along the left limit of the creek.



Stripping at the H. Axel mining operation along the left limit of Scroggie Creek in 1981. Black muck must be removed continually as it thaws if heavy equipment is to work on the frozen base. Thawed black muck is unable to support heavy equipment.

Lee's Jade and Opals Ltd. (20)
Queenstake Resources Ltd. 115 O 2
Barker Creek 63° 05'N, 138° 57'W
1979, 1980
1981, 1982

Deposits from this location, which is on a left limit bench along Barker Creek at the mouth of Iron Creek consist of .5 metres (2 feet) of muck overlying 1.2 to 3 metres (4 to 10 feet) of gravel.

Work done on the property during 1979 consisted of stripping with a JD 440 bulldozer, and test sampling. In 1980, four people worked at the site using a JD 450B bulldozer, and a 45 cm by 6 metre (18 inch by 20 feet) steel sluice box with 1.2 by 2.5 metre (4 by 8 feet) dump box. Two settling ponds, and a 150 metre (500 feet) long ditch from the sluice box to the ponds were constructed. During 1981, a D6D bulldozer was used for stripping, a 930 loader was used to feed the sluice box, and the JD 450B bulldozer was used to stack tailings. Queenstake Resources Ltd. took the property over from Lee's Jade and Opals Ltd. in 1982. Using a D6D and a D8H bulldozer, and a 930 loader, five employees mined and processed a bulk sample of 38,250 cubic metres (50,000 cubic yards). Some water for sluicing was recirculated in periods of shortage. The 1982 mining season was dry. Queenstake felt that the "bulk sample program did not indicate a unit value sufficient to sustain a profitable operation" (November, 1982 Shareholder Report).

Barker Creek Placer (21)
Exploration Co. 115 O 2
Barker Creek 63° 02'N, 138° 57'W
1982

This property is situated on a left limit bench along the upper reaches of Barker Creek, just east of the headwaters of Thistle Creek. The section is 2.5 to 4.5 metres (8 to 15 feet) thick and consists of .5 to 1.5 metres (2 to 5 feet) of black muck overlying 2 to 3 metres (6 to 10 feet) of gravel with boulders to 30 cm (12 inches) in diameter. The deposits are frozen. There are several hydraulic cuts 60 or more years old on the bench in the area.

Mining on the property was done during 1982 by two men using a JD 450 bulldozer for stripping, and a 931 loader for feeding the sluice box. The area mined lies between old hydraulic cuts. The sluice used was .5 metres (18 inches) wide, and 10.5 metres (35 feet) long. The water used for sluicing was recirculated from three settling ponds at the base of the bench.

Goldmark Minerals (22)
Thistle Creek 115 O 3
1980, 1981, 1982 63° 05'N, 139° 17'W

This property is situated along Thistle Creek,

approximately 10.6 km (6.6 miles) upstream from its confluence with Yukon River and just downstream from the mouth of Blueberry Creek. The area was drilled by Yukon Gold Placers, Ltd. during 1945 and 1946. The company did stripping from 1947 to 1950, and dredged from 1949 to 1952. Deposits worked by Goldmark Minerals include the airstrip prepared in 1947 by Yukon Gold Placers, Ltd., and a section of 3 metres (10 feet) of gravel which was stripped by the earlier workers.

Work in 1980 was done by 10 employees using a D7E bulldozer, a D8K bulldozer, and a 980C loader. Material mined was processed through a "Pearson" sluice box with a capacity of 230 cubic metres (300 cubic yards) per hour. A drain, return water pond, and settling pond were constructed. Work in 1981 was done using the same equipment as in 1980, plus one additional D8K bulldozer to mine in the valley bottom and along a low right limit bench. Work continued on a reduced scale in 1982. One cut 100 metres (330 feet) square was mined.

Gold from Thistle Creek is reported to have a fineness of 848 to 895.

Goldmark Minerals **(23)**
Kirkman Creek **115 O 3**
1980, 1981 **63° 01'N, 139° 20'W**

This property is situated along Kirkman Creek, approximately 3.2 km (2 miles) upstream from its confluence with Yukon River. Deposits on this creek were drilled by Yukon Gold Placers, Ltd. in 1946, and worked by L. Ross from 1957 to 1964.

Goldmark Minerals carried out test work at this property in 1980, and mined in 1981.

Gold from Kirkman Creek is reported to have a fineness of 860 to 896.

NOTES

115P

HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983.
DOTS INDICATE PLACER MINING OPERATIONS ACTIVE DURING THE PERIOD 1978 TO 1982. NUMBERS BESIDE THE DOTS RELATE TO THE TEXT.

McQUESTEN

YUKON TERRITORY

5 0 5 10 15 20 25 30

KILOMETRES

PLACER MINING OPERATIONS IN THE McQUESTEN MAP AREA, NTS 115 P

Dawson Mining Equipment Ltd. (1)
D. Bverge 115 P 13
D. Randolph 63° 49'N, 137° 42'W
Zinc Creek
1981, 1982

This property is situated along Zinc Creek approximately 4.6 km (2.9 miles) upstream from its confluence with Barlow Creek. The Zinc Creek valley is narrow, and steep-sided at this location. Deposits consist of 1 metre (3 feet) of black muck overlying 4.3 metres (14 feet) of gravel.

Dawson Mining Equipment Ltd. worked at this property in 1981. Seven people mined using a John Deere 450 bulldozer, a D9 bulldozer, and a 988C loader. A "Placer King" screening and sluicing unit with wobble feeder and vibrating sluices was used to process the gravel. The unit "plugged up" when recycled water was used for sluicing. Three settling ponds and one water reservoir were constructed. D. Bverge and D. Randolph did test work in 1982. They mined by hand, and used a rocker and long tom to wash the gravel.

Litchfield Mining (2)
Barlow Creek 115 P 13
1982 63° 46'N, 137° 39'W

This property is situated along Barlow Creek, approximately 2.7 km (1.6 miles) upstream from its confluence with Clear Creek, and immediately upstream from the Clear Creek road crossing.

Six people worked at this location in 1982, using one bulldozer and one backhoe to mine a small cut along the right limit of the creek. The material mined was processed through a washing unit with trommel, vibrating screens, and sluice.

Crescent Mines Ltd. (3)
Punters Gold Explorations 115 P 13
Clear Creek 63° 46'N, 137° 33'W
1978, 1979, 1980
1981, 1982

This property is situated along the right limit of Clear Creek, approximately 7 km (4.4 miles) upstream from the mouth of Barlow Creek. Deposits at this location consist of 1 metre (3 feet) or less of organic material overlying 3 metres (10 feet) of brown sandy cross-bedded and channelled gravel. The area had not been previously mined.

Work was begun by Crescent Mines in 1978. The company used a bulldozer for stripping, and a backhoe to dig 20 to 30 pits for bulk samples. Road building was also done. Test work continued in 1979, when reserves of 225,000 cubic metres (295,000 cubic yards) of gravel containing 1.095 grams per cubic metre (.027 ounces per cubic yard) of gold were outlined. The gold was found to be erratically distributed through the gravel. Mining was begun in 1980, when 10 workers on two shifts used a D8K bulldozer, a 980C loader, and a tracked loader with 1 cubic metre (1.25 cubic yard) buck to mine approximately 1,700 cubic metres (2,250 cubic yards) of material per day. A "Pearson" box was used to sluice the gravel. Work continued in 1981. Punters Gold Explorations took over the property in 1982. Eight people worked on two shifts using a D8K bulldozer, a 950 loader, and a 980 loader to mine, and a "Derocker" and multiple channel sluice box to process the gravel. The "Derocker" was adjusted so that only grains less than 2.5 cm (1 inch) in diameter could pass through it, and separate channels were used in the sluice box for grains larger and smaller than .6 cm (.25 inches).

View downstream along Clear Creek at the site of the Crescent Mines Ltd. - Punters Gold Explorations mining operations.

Processing unit used by Punters Gold Explorations in 1982. The modified "Derocker" removes all grains coarser than 2.5 cm (1 inch) prior to sluicing. Punch plate further sizes grains at the head of the sluice box. Those from .6 to 2.5 cm (.25 to 1 inch) are sluiced in the channel at left, while those finer than .6 cm (.25 inch) are divided between the four channels at right for sluicing.

Approximately 70 cubic metres (90 cubic yards) of material per hour were fed to the "Derocker". Of that, approximately 23 cubic metres (30 cubic yards) passed on to the sluices.

Gold recovered from this site was fine-grained, flat, and appeared worn.

Squaw Creek Mining **(4)**
Squaw Creek **115 P 14**
1980, 1981, 1982 **63° 47'N, 137° 28'W**

This property is located on Squaw Creek, approximately 1.3 km (.8 miles) upstream from its confluence with Clear Creek. Deposits in the narrow valley consist of sandy gravel.

Work on this property was begun in 1980, when a road was built, stripping was done with a D8K bulldozer, and a few test pits were dug. More test work was done in 1981, when the original test pits were enlarged and several more were dug. Mining was begun in 1982, when five people worked on one shift using a D6 bulldozer, a D8H bulldozer, and a Hi Hoe backhoe with 1.1 cubic metre (1.5 cubic yard) bucket. A sluice box with grizzly was used to process the gravel at a rate of approximately 200 cubic metres (260 cubic yards) per day. Water for sluicing was recirculated.

Gold from this location is reported to have a fineness of 870.

Sundance Gold Ltd. **(5)**
Clear Creek **115 P 14**
1980, 1981 **63° 47'N, 137° 17'W**

This property is situated along Clear Creek, approximately 400 metres (1,300 feet) downstream from the mouth of Left Clear Creek.

Work at this location was begun in September, 1980, when approximately 375 to 600 cubic metres (500 to 800 cubic yards) of material from test pits along the right limit of the creek were sluiced per day. Work continued in 1981 when two D8 bulldozers, a D9 bulldozer, and two 988 loaders were used along with a "Pearson" sluice box to mine and process the gravel.

Queenstake Resources Ltd. **(6)**
Clear Creek **115 P 14**
1979, 1980, 1981, 1982 **63° 47'N, 137° 15'W**

This property is situated along Clear Creek, just upstream from the mouth of Left Clear Creek. Deposits consist of 1 metre (3 feet) or less of organic debris overlying approximately 3.7 metres (12 feet) of cross-bedded and channelled brown sandy gravel. Reserves on the property in 1981 were reported to be in excess of 2,300,000 cubic metres (3,000,000 cubic yards) of gravel containing .65 to .81 gm per cubic metre (.016 to .020 ounces per cubic yard) of gold, plus significant amounts of scheelite and cassiterite.

Gold was discovered in the Clear Creek valley in the early 1900's, and hand mining was carried out for a number of years downstream from the confluence of Left Clear Creek and Clear Creek. In September 1942, a dredge operated by Clear Creek Placers Ltd. began mining on Left Clear Creek. It operated until 1956, when rising costs and the fixed gold price forced its closure. Support equipment was moved from the property, and the dredge was "dry-docked" at the junction of Clear Creek and Left Clear Creek. Several small bulldozer mining operations were active on Left Clear Creek during the 1970's as a result of higher gold prices, but the right fork of the creek received little work until 1979.

View downstream along Right Fork of Clear Creek showing the Queenstake Resources Ltd. dredge. Tailings behind the dredge have been levelled, and numerous settling ponds have been constructed. The diversion ditch is along the right limit of the valley.

View of the Queenstake Resources Ltd. dredge in 1982. The bucket line at the right of the dredge is digging gravel from the creek bed and transporting it to the trommel inside the dredge. Oversize from the trommel is being dumped on a tailings pile by the stacker at the left of the dredge. Undersize from the trommel is being sluiced. Tailings from the sluices are being dumped from the small tail races at the left of the dredge in part, and in part are being pumped out the stacker with the coarse tailings.

Queenstake Resources Ltd. carried out a bulk sampling program along the lower 11.2 km (7 miles) of the right fork of Clear Creek in 1979, using a backhoe. During 1980, the company built a 20 person trailer camp, a machine shop, and other support facilities. The dredge was completely overhauled. All moving parts were rebuilt, and new generating units, electrical system, pumps, compressor, and control mechanisms were installed. The road to the mine site was upgraded, and ground preparation of reserves for two season of mining was done. The 320 tonne (350 ton) dredge operated satisfactorily during a test period in September. Work done in 1980 cost $1,100,000. The refurbished dredge began its first full season of mining in 1981. It was the only bucket-line dredge mining placer deposits in Canada, and the first to do so since the operations of Yukon Consolidated Gold Corp. Ltd. in the Dawson City area closed in 1966. The dredge operated from June to October at a rate of approximately 1,500 cubic metres (2,000 cubic yards) of material per day, and mined an area 50 metres (160 feet) wide, 1,200 metres (3,900 feet) long, and 2.5 metres (8 feet) deep. There were 52,400 gm (1,685 ounces) of crude gold recovered. A D9 bulldozer and Michigan 125 loader were used for stripping and other work in 1981. Thirteen people continued work on the property in 1982. The dredge operated on three shifts from late June until October, and mined and processed approximately 175,000 cubic metres (225,000 cubic yards) of material. There were 63,400 gm (2,038 ounces) of crude gold recovered. A small jig was used to process sluice box concentrates from the dredge. The dredge was modified to ensure that fine grains were mixed with coarse material in the tailings, in an attempt to promote rapid revegetation of the dredged area. Numerous settling ponds were built in the tailings. Stripping was done in preparation for dredging in 1983. In addition, work continued on a by-pass to allow fish to circumvent the area of active dredging. Costs in 1982 totalled $863,805, or an average of $6.15 per cubic metre ($4.70 per cubic yard) of material dredged. Costs for 1983 are forecast to average $4.25 per cubic metre ($3.25 per cubic yard) of material dredged.

Gold from this property is generally tabular and appears worn, although some rough and hackly grains are recovered. Gold from Clear Creek is reported to have a fineness of 828 to 860.

R. Lazotte (7)
W. Genier 115 P 14
Clear Creek 63° 47'N, 137° 12'W
1979, 1980

This property is situated along Clear Creek, approximately 3.7 km (2.3 miles) upstream from the mouth of Left Clear Creek. Deposits at the site consist of 1.2 metres (4 feet) of black muck overlying 3.7 to 4.6 metres (12 to 15 feet) of gravel. Bedrock is graphitic phyllite.

R. Lazotte and W. Genier worked at this location in 1979 and 1980 using a D7 bulldozer, and a loader to mine approximately 75,000 cubic metres (100,000 cubic yards) of material.

General Mining (8)
Clear Creek 115 P 14
1982 63° 47'N, 137° 16'W

This property is situated along the banks of Left Clear Creek, just upstream from its confluence with Clear Creek. Deposits at this location include pre-glacial, glacial, and post-glacial gravel.

Work done by General Mining in 1982 consisted of an extensive program to locate and evaluate gold-bearing pre-glacial gravel along Left Clear Creek. Two D9 bulldozers were used to strip .6 metres (2 feet) of surficial deposits from areas approximately 100 metres (330 feet) wide and 450 metres (1,475 feet) long along both sides of the valley. A backhoe was used to dig numerous trenches to expose the material present, and to provide bulk samples.

Clear Creek Gold Mines (9)
W. Scott 115 P 14
L. Loge 63° 49'N, 137° 16'W
Barney Pup
1978

This property is situated along Barney Pup, just upstream from its confluence with Left Clear Creek. Deposits at this location are approximately 3 metres (10 feet) deep. Bedrock is sericite schist.

Two people worked at this site in 1978, using a D6 bulldozer and two D8 bulldozers to mine one cut approximately 9 by 30 metres (30 by 100 feet) at the mouth of Barney Pup and a second cut 45 by 90 metres (150 by 300 feet) 450 metres (1,500 feet) further upstream. The uppermost metre (3.3 feet) of bedrock was mined and sluiced along with the gravel.

In addition to gold, magnetite, and minor amounts of cassiterite and cinnabar were recovered from Barney Pup.

Clear Creek Gold Mines (10)
W. Scott 115 P 14
L. Loge 63° 49'N, 137° 17'W
Clear Creek
65 Pup
1978, 1979, 1980

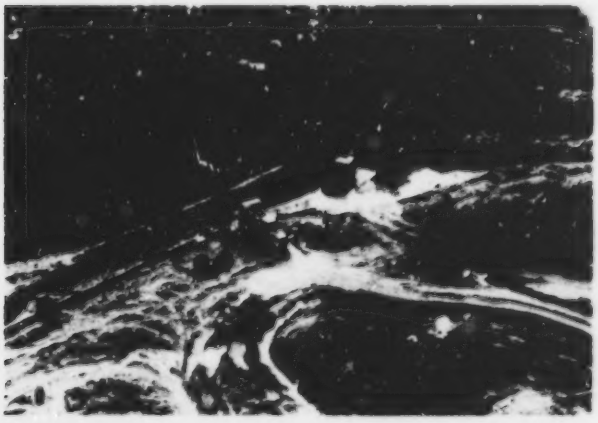
This property is situated along 65 Pup and Left Clear Creek, at and near their confluence. The area upstream along Left Clear Creek from the mouth of 65 Pup was dredged between 1942 and 1956 by Clear Creek Placers Ltd.

W. Genier and L. Loge began work at this location in 1978, and mined a cut of approximately 2,750 square metres (29,500 square feet) along the right limit of Left Clear Creek, just downstream from the mouth of 65 Pup. They used a D6 and two D8 bulldozers to mine. The section in that cut consisted of approximately 3 metres (10 feet) of gravel overlain by muck and schist slide rock. They used the same equipment to continue work in the area during 1979, and 1980.

Blackstone Placer Mining Ltd. (11)
N. Harper 115 P 14
Clear Creek 63° 50'N, 137° 08'W
1978, 1979, 1980
1981, 1982

This property is situated along the upper portion of Left Clear Creek, approximately 2 km (1.3 miles) upstream from the mouth of Lewis Gulch. Deposits consist of .6 metres (2 feet) of black muck overlying an irregular layer of gravel 1.8 to 3 metres (6 to 10 feet) thick. Boulders up to 1.5 metres (5 feet) in diameter are present in the gravel.

Blackstone Placer Mining Ltd. began work at this property in 1976. Work continued in 1977. In 1978 and 1979, a bulldozer and a loader were used for stripping and mining. Two D8 bulldozers and a loader were used in 1979. A bedrock drain 150 metres (500 feet) long was dug, and two settling ponds were built in 1980. A reservoir provided gravity-fed water for sluicing. A D7 bulldozer, a D8 bulldozer, two Hough 90E loaders with 3 cubic metre (4 cubic yard) buckets, and a 90 cm (36 inches) wide sluice box 9 metres (30 feet) long were used in 1981. Five people continued work with the same equipment in 1982. They mined a cut along the right limit of the creek. Sluicing water was impounded in a series of three settling ponds.



View of mining operations at the Blackstone Placer Mining Ltd. property of Clear Creek in 1982. A bulldozer is being used to mine the gravel and move it to a stockpile. A loader is being used to feed the sluice box. Tailings are being removed by a second loader.

T. Bazylinsky (12)
Clear Creek 115 P 14
1978, 1979, 1980, 1981 63° 51'N, 137° 07'W

This property is located along the headwaters of Left Clear Creek, approximately 4 km (2.5 miles) upstream from its confluence with Lewis Gulch. Deposits at this site consist of .6 to 1.5 metres (2 to 5 feet) of alternating grey and brownish-black silty and organic-rich muck overlying 1.2 to 3 metres (4 to 10 feet) of gravel. A section .3 to .6 metres (1 to 2 feet) thick near the base of the gravel is cemented by iron and manganese oxides. A similar cemented gravel unit occurs at Gem Creek, approximately 19 km (11.9 miles) northeast of this site. A layer of variable thickness of colluvium consisting of angular clasts in a clayey matrix caps the gravel and muck section. Magnetite and gold were reported to be present in all three units.

A limited amount of ground preparation was done on the property in 1978. In 1979, one person mined using a D8 bulldozer, and loader with 3.8 cubic metre (5 cubic yard) bucket. Water for sluicing was gravity-fed. The same equipment was used to continue work in 1980 and 1981. The cut mined in 1981 was along the right limit of the creek. Two settling ponds of 1,400 square metres (15,000 square feet) each were constructed in 1981. No work was done on the property during 1982.

Arch Creek Mining Ltd. (13)
Canada Tungsten Mining Corp. Ltd. 115 P 14
Josephine Creek 63° 54'N, 137° 10'W
1979, 1980,
1981, 1982

This property is situated along Josephine Creek, approximately 3 km (1.9 miles) upstream from its confluence with Little South Klondike River (Big Creek). Deposits consist of .3 metres (1 foot) of black muck overlying 1.8 to 2.4 metres (6 to 8 feet) of gravel. The area has not been mined previously.

Work at this location was begun in 1979. A D8 bulldozer and a Case W26B loader with 3.8 cubic metre (5 cubic yard) bucket were used by Arch Creek Mining Ltd. to do stripping and mining, and to prepare a bedrock drain 6 metres (20 feet) deep and 120 metres (400 feet) long. Three settling ponds were also built. Work continued in 1980. The same equipment was used to strip 15,000 cubic metres (20,000 cubic yards) of material, and mine an additional 13,750 cubic metres (18,000 cubic yards) for sluicing. Two additional settling ponds were built. Water for sluicing was recirculated, as the total flow of Josephine Creek was less than 9,000 litres (2,000 gallons) per minute at this site. Canada Tungsten Mining Corp. Ltd. did test work in 1981, using a D7 bulldozer, a 931B loader, and a small sluice box. In addition, Arch Creek Mining Ltd. continued mining. Both companies were active in 1982, when Canada Tungsten continued test work using the D7 bulldozer and 931B loader, and Arch Creek Mining mined for a few weeks using the D8 bulldozer and Case W26B loader. All work was done along the right limit of the creek.

A. Genier (14)
Arizona Creek 115 P 15
Hobo Creek 63° 59'N, 136° 53'W
1979, 1980, 1981

Deposits from this location, which is along the right limit of Arizona Creek and the left limit of Hobo Creek at the confluence of the two streams, are not frozen. The section consists of up to 1 metre (3 feet) of black muck overlying 2 to 2.5 metres (6 to 8 feet) of gravel without coarse boulders.

Work done on the property during 1979 consisted of stripping and testing. A 950 and a 966 loader with 2.5 cubic metres (3.5 cubic feet) capacity buckets and a D7 bulldozer were used. Mining was done during 1980. Three

settling ponds were constructed to treat waste-water from sluicing. In 1981, three or four people worked at the site with a 966 and a 980C loader, and a D7 bulldozer. A "Placer King 500" sluice unit with vibrating screening unit, and a 75 cm by 12 metre (30 inch by 40 feet) sluice box was used to process this gravel.

View upstream along Hobo Creek at the A. Genier property. A series of settling ponds were constructed in mined out cuts. The Hobo Creek diversion runs along the right limit of the valley.

Tamandara Resources Ltd. **(15)**
Gem Creek **115 P 15**
1978, 1979, 1980 **63° 57'N, 136° 49'W**
1981, 1982

This property is located on Gem Creek, a left limit tributary of Sprague Creek at its headwaters. Deposits consist of 1.8 to 2.4 metres (6 to 8 feet) of clast supported gravel with interstratified sandy gravel. Clasts are generally flat, and less than 15 cm (6 inches) in diameter, although round, larger boulders are also present. The gravel is prominently stained by iron oxide, and in a few places is cemented by it. Similar deposits of gravel cemented by iron oxide have been noted at the headwaters of Left Clear Creek, 19 km (11.9 miles) to the southwest. Bedrock is schist. There is evidence of former hand mining operations at this location.

Work at this property was done each season from 1978 to 1982. A small bulldozer, and loader were used to work on an access road, do stripping, testing, and a small amount of mining. The flow rate of Gem Creek is low.

View upstream along Gem Creek to the Tamandara Resources Ltd. property. The area mined, and two small settling ponds are visible in the centre of the photograph.

Canada Tungsten Mining Corp. Ltd. **(16)**
Secret Creek **115 P 16**
Swede Creek **63° 59'N, 136° 01'W**
1982

This property is situated along Swede and Secret Creeks at and near their confluence. Swede Creek has never been mined. A small section of Secret Creek has been mined.

Canada Tungsten Mining Corp. Ltd. began an extensive exploration and evaluation program of placer deposits in Dublin Gulch and the surrounding area in 1980. On Swede and Secret Creeks, 24 trenches totalling 4,075 cubic metres (5,330 cubic yards) were dug. Concentrates from Swede Creek contained gold and cassiterite. Concentrates from Secret Creek contained gold, cassiterite, and scheelite. In 1982, drilling was done on Haggart Creek and its tributaries. There were 152 holes totalling 2,087 metres (6,845 feet) drilled. A Becker hammer drill, and a Schramm T64H air rotary drill, both mounted on Nodwells were used for drilling. The hammer drill was not effective for holes more than 15 metres (50 feet) deep, but was more effective than the air rotary drill at including any gold encountered with the rest of the sample. Seven holes totalling 170 metres (560 feet) were drilled on Swede Creek, and four holes totalling 38 metres (126 feet) were drilled on Secret Creek.

Paydirt Holdings **(17)**
Seattle Creek **115 P 16**
1980, 1981 **63° 49'N, 136° 02'W**

This property is located along the headwaters of

Seattle Creek, approximately 4.2 km (2.6 miles) upstream from its confluence with Morrison Creek. Deposits exposed at the site are from 19.8 to 24.4 metres (65 to 80 feet) thick. Bedrock was not reached. The deposits consist of sandy gravel, clean sand, and clay. The sand is similar to other thick deposits of fine- to medium-grained cross-laminated sand found at elevations between 760 and 915 metres (2,500 and 3,000 feet) in many of the creeks between Johnson and Haggart Creeks. The gold-bearing horizons at Seattle Creek are reported to lie immediately above the clay layers.

Work done at this property in 1980 and 1981 was done along the left limit of the creek at the mouth of a tributary. Two D8 bulldozers were used to mine in 1980. One D8 bulldozer and a loader were used in 1981. A "Pearson" three channel sluice box was used to process the material mined. Mining was made difficult by flooding of the cut by groundwater.

Gold from this location is reported to be iron-stained, and to have the colour and shape of bran flakes.

Stardust Mining Ltd. **(18)**
Morrison Creek **115 P 16**
1981, 1982 **63° 49'N, 136° 08'W**

This property is situated along Morrison Creek downstream from the canyon, and approximately 2.7 km (1.7 miles) upstream from the confluence of Morrison and Seattle Creeks.

Three people began work at this location in August 1981, using a D8K bulldozer, and a John Deere 450 loader. They mined a cut along the left limit of the creek, and processed it in a 60 cm (24 inch) wide sluice box 7.3 metres (24 feet) long with 15 cm (6 inches) grizzly and 2.5 cm (1 inch) screen. Water for sluicing was gravity-fed. Mining continued during June and July, 1982 until flooding in the cut forced work to stop. An area downstream along the right limit of Morrison Creek was stripped in preparation for mining in 1983. Three settling ponds were constructed in 1982.

R. Beach **(19)**
Unnamed Creek **115 P 16**
Morrison Creek **63° 48'N, 136° 12'W**
1981, 1982

This property is situated along an unnamed left limit tributary of Morrison Creek, which drains the northeastern part of Scheelite Dome. The property is approximately 1.4 km (.9 miles) upstream from Morrison Creek. Deposits at this location are frozen. They consist of 1.2 metres (4 feet) of black muck overlying stratified iron-stained gravel.

Work on the property was begun in 1981 by two people using a D4 bulldozer and a John Deere 450 loader. They did stripping, and test mining. Work continued in 1982, when a D4 and a D7 bulldozer, and a John Deere 1010 loader-backhoe were used along with a sluice box 45 cm (18 inches) wide and 6 metres (20 feet) long. Water for sluicing was gravity-fed, and was impounded after sluicing in one settling pond. The area mined was along the right limit of the creek.

Bardusan Placer Ltd. **(20)**
Johnson Creek **115 P 16**
1980, 1981, 1982 **63° 47'N, 136° 22'W**

This property is situated along the middle portion of Johnson Creek, approximately 1.8 km (1.1 miles) downstream from its confluence with Sabbath Creek. Deposits at the site are 5.5 to 7.3 metres (18 to 24 feet) thick, and consist of .6 metres (2 feet) of muck overlying 1.8 to 2.4 metres (6 to 8 feet) of featureless gravel with locally derived clasts, and 3.7 to 4.0 metres (12 to 13 feet) of polymictic sandy to silty gravel with imbricated clasts. The gravel is prominently stained by manganese and iron oxides from its base to 3.7 to 4.3 metres (12 to 14 feet) above bedrock, regardless of the gravel type.

Bardusan Placer Ltd. began work at this property in 1959, and mined each year until 1966. Work was done elsewhere from 1967 to 1979, but was resumed at this site in 1980 and continued in 1981 and 1982. Three people mined each year using a D7 bulldozer and a loader with 2.3 cubic metre (3 cubic yard) bucket. The uppermost 1.2 to 1.5 metres (4 to 5 feet) of material was stripped, and the remainder was sluiced in a sluice box 90 cm (36 inches) wide and 9 metres (30 feet) long. Water for sluicing was gravity-fed. The area mined in 1980 was approximately 21 metres (70 feet) wide, and 150 metres (500 feet) long. An area approximately 30 metres (100 feet) wide and 250 metres (800 feet) long was mined in 1981. The area mined in 1982 was approximately 30 metres (100 feet) wide and 215 metres (700 feet) long.

Gold from Johnson Creek is reported to have a fineness of 760 to 820. It is flat, and has a worn appearance. Cassiterite, scheelite, and cerussite-coated galena are also recovered from Johnson Creek. The largest gold nugget reported recovered from the creek was 155 gm (5 ounces), while the largest galena nugget reported was approximately 45 kg (100 pounds). The galena is thought to be derived from the area west of the creek, and within 350 metres (1,150 feet) north of the major left limit tributary of the creek. The galena has a low silver content.

C & I Construction Ltd. **(21)**
Johnson Creek **115 P 16**
1978, 1979 **63° 47'N, 136° 21'W**
1980, 1982

This property is situated along Johnson Creek, just downstream from the mouth of Sabbath Creek. Deposits present consist of sandy colluvium with angular clasts and some organic material, overlying stratified gravel with clasts less than 7.5 cm (3 inches) in diameter, and 3 metres (10 feet) or more of polymictic imbricated sandy gravel with abundant large boulders up to 60 cm (24 inches) in diameter. The lowermost 2.5 metres (8 feet) of gravel are prominently stained by iron oxides. Bedrock is badly decomposed schist. The deposits being mined lie along the margins of tailings from earlier mining operations at this location.

Work was done on the property in 1978 by three people working with an International TD-25 bulldozer, a 944A loader with 2.3 cubic metre (3 cubic yard) bucket, and a Michigan 125 loader with 5.3 cubic metre (7 cubic yard) bucket. Two cuts approximately 15 metres (50 feet) wide, and 30 and 75 metres (100 and 250 feet) long

respectively were mined. Work continued in 1979 and 1980, but was not done in 1981 when C & I Construction Ltd. worked on a nearby property on Sabbath Creek. Work was again done at this location in 1982, when three people mined using the TD-25 bulldozer and 125 loader. A single-channel sluice box with grizzly was used to process the gravel. Sluicing water was impounded in two settling ponds.

Coarse sandy gravel with imbricated boulders at the C & I Construction Ltd. property at Johnson Creek. The dark material coating some of the boulders is iron oxide.

C & I Construction Ltd. (22)
Sabbath Creek 115 P 16
1981 63° 46'N, 136° 20'W

This property is located along the left limit of Sabbath Creek, approximately 1.8 km (1.1 miles) upstream from its confluence with Johnson Creek at the mouth of an intermittent stream known locally as Scheelite Gulch. Deposits at this site contain abundant very large boulders, and much scheelite.

Work was done on this property in 1981 by three people using an International TD-25 bulldozer, and a Michigan 125 loader with 5.3 cubic metre (7 cubic yard) bucket.

D. Szutiak (23)
Highet Creek 115 P 16
1981 63° 45'N, 136° 14'W

This property is situated along the right limit of Highet Creek at its headwaters.

Work at this site was done by D. Szutiak in 1981. A D8 bulldozer was used to prepare the cut, after which Mr. Szutiak mined by hand.

F. Erl (24)
Highet Creek 115 P 16
1978, 1979, 1980 63° 46'N, 136° 12'W
1981, 1982

This property is situated along the upper portion of Highet Creek, just upstream from the mouth of Rudolph Pup. Deposits consist of 1.8 to 6 metres (6 to 20 feet) of colluvium overlying 1.8 to 2.4 metres (6 to 8 feet) of sandy gravel with iron and manganese oxide staining. The Highet Creek valley is narrow in this area, and the colluvium thickens rapidly along the left limit of the creek due to the steepness of the slope there. Bedrock is blocky weathering sericite schist. Old workings, including a drift 60 metres (200 feet) long, are present in the area.

Sluice box with grizzly at the F. Erl mining operation at Highet Creek. The thick deposits along the left limit of the creek can be seen in the background.

F. Erl worked at this location part-time from 1961 until 1979. He began mining full-time in 1980 using a D8 bulldozer to strip colluvium, and a 941 tracked loader with 1.1 cubic metre (1.5 cubic yard) bucket to mine the gold-bearing gravel. A cut approximately 18 metres (60 feet) wide, 40 metres (130 feet) long and 4.9 to 6 metres (16 to 20 feet) deep along the left limit of the creek was stripped and mined in 1980. Work continued in 1981. A grizzly was added to the single-channel sluice box. Water for sluicing

was gravity-fed from a small reservoir. The same equipment was used in 1982 to strip and mine three cuts of approximately 225 square metres (2,400 square feet) each. From 1.8 to 6 metres (6 to 20 feet) of colluvium was stripped, and 2.4 metres (8 feet) of gravel was mined and sluiced at each cut.

Much of the gold from this location does not appear worn. Some grains bear the imprint of matrix material from a lode source, and some have quartz attached, but others appear rounded and well-worn. Magnetite, scheelite, wolframite, and minor amounts of oxide-coated stibnite are recovered along with gold at this location.

W. Gordon (25)
W. Tuck
Rudolph Pup 115 P 16
Highet Creek 63° 46'N, 136° 12'W
1978, 1979, 1980
1981, 1982

This property is situated along Rudolph Pup near its mouth, and on Highet Creek just downstream from the mouth of Rudolph Pup. Deposits at this location consist of up to 9.1 metres (30 feet) of gravel, sand, and colluvium along the left limit of Highet Creek, and up to 6 metres (20 feet) of colluvium, sandy matrix-supported gravel, and sand on a discontinuous right limit bench of Highet Creek. The sand horizon, which consists of fine- to medium-grained cross-laminated sand is similar to other sand horizons occurring at elevations between 760 and 915 metres (2,500 and 3,000 feet) in many of the creeks between Johnson and Haggart Creeks. A more complete description of the deposits at this location is given by D. Emonds in D.I.A.N.D. 1981 Yukon Mineral Industry Report. The deposits at Rudolph Pup are not frozen.

Matrix-supported sandy gravel and laminated sand along the discontinous right limit bench of Highet Creek at the W. Gordon property. The gravel unit has cut a deep channel in the underlying sand.

W. Gordon began work at this property in 1975. He worked with W. Tuck in 1978, using a Michigan 35 loader with .75 cubic metre (1 cubic yard) bucket, a Michigan 975 loader with 1.5 cubic metre (2 cubic yard) bucket, and a John Deere tracked loader with 1.1 cubic metre (1.5 cubic yard) bucket to mine a cut approximately 9 metres (30 feet) wide, 18 metres (60 feet) long, and 4.5 metres (15 feet) deep on Rudolph Pup, and a cut approximately 7.5 metres (25 feet) wide, 30 metres (100 feet) long, and 7.5 metres (25 feet) deep along the left limit of Highet Creek. Work continued on Rudolph Pup and Highet Creek in 1979. Mr. Gordon worked using the Michigan 35 loader in 1980 to mine a cut approximately 15 metres (50 feet) wide, 25 metres (80 feet) long, and 7.5 to 9 metres (25 to 30 feet) deep on Rudolph Pup, while Mr. Tuck worked using a D8 bulldozer and the Michigan 975 loader to mine two cuts along the left limit of Highet Creek. They worked together in 1981, to mine a large cut along the left limit of Highet Creek. Mr. Gordon worked alone using the Michigan 35 and 975 loaders in 1982 to mine a small cut on the right limit bench of Highet Creek. Water for sluicing was gravity-fed from Rudolph Pup.

Gold from this property is of two types. One does not appear worn, and includes well-formed wire gold, while the other is flat and well-worn. In addition to gold, coarse scheelite and stibnite are recovered from deposits at this property. The coarsest grains come from Rudolph Pup.

Bleiler Placers Ltd. (26)
Highet Creek 115 P 9
1978, 1979, 1980, 63° 45'N, 136° 09'W
1981, 1982

This property is situated along the middle portion of Highet Creek at the mouth of Hayden (Dredge) Creek. Deposits are up to 15 metres (50 feet) thick, and consist of 1 to 2 metres (3 to 7 feet) of colluvium overlying up to 14 metres (47 feet) of poorly stratified sandy to silty polymictic gravel with clasts generally up to 30 cm (12 inches) in diameter, although larger clasts do occur. Much previous work has been done in this area, beginning in 1904. Underground mining, open cut mining, and dredging have all been done. The dredging operation was not successful because the dredge was unable to handle the large boulders encountered, and because it was not able to dig deeper than 7.5 or 9 metres (25 or 30 feet). It mined approximately 450 metres (1,500 feet) along the creek in 1912.

Two people worked on the property in 1978 using a D8H bulldozer, a loader with 3 cubic metre (4 cubic yard) bucket, and a Traxcavator to mine one cut 12 metres (40 feet) wide, 60 metres (200 feet) long and 9 metres (30 feet) deep along the right limit of the creek, and a number of small cuts along the left limit of the creek. The same equipment was used in 1979 to strip approximately 23,000 cubic metres of material, and to mine an additional 53,500 cubic metres for sluicing. The sluice box used was 1.2 metres (4 feet) wide and 12 metres (40 feet) long. Work continued in 1980. A D8H bulldozer and 988B loader with 5.4 cubic metre (7 cubic yard) bucket was used to strip approximately 15,000 cubic metres (20,000 cubic yards) of material, and mine an additional 38,000 cubic metres (50,000 cubic yards) for sluicing. A water reservoir 8,000 square metres (2 acres) in area, and two settling ponds were constructed. In 1981, two people working with a D8K bulldozer and 988B loader mined and sluiced approximately 57,500 cubic metres (75,000 cubic yards) of material from a cut 10.5 metres (35 feet) deep. No stripping was done. The same equipment was used in 1982 to mine approximately 62,500 cubic metres (82,000 cubic yards) of

material. The bulldozer mined, and fed the sluice box at a rate of 95 cubic metres (125 cubic yards) of gravel per hour. The loader was used to remove the tailings. Water for sluicing was gravity-fed.

Gold from this property is reported to have a fineness of 820.

J. Sveen **(27)**
Highet Creek **115 P 9**
1981, 1982 **63° 44'N, 136° 08'W**

This property is situated along the left limit of Highet Creek, approximately 3 km (1.9 miles) upstream from its confluence with Minto Creek. Deposits consist of a very thick section of sandy glaciofluvial gravels. A large hydraulic cut has been mined at this location by previous operators.

J. Sveen worked alone at this property during parts of the 1981 and 1982 seasons. A D8 bulldozer was used to strip a small area, which was then mined by hand. A small sluice box 60 cm (24 inches) wide and 1.8 metres (6 feet) long was used to process the gravel. Water was gravity-fed from a small left limit tributary of Highet Creek, but the water supply was intermittent.

Peter Kiss Oilfield Construction Limited **(28)**
T. Takis **115 P 9**
E. Sevosik **63° 44'N, 136° 10'W**
McIntyre Creek
1981, 1982

This property is situated along the upper portion of McIntyre Creek, approximately 2.6 km (1.6 miles) upstream from its confluence with Minto Creek. Although a complete section was not exposed along McIntyre Creek, it appears that a thin layer of muck overlies a thin layer of gravel, at least 4.5 metres (15 feet) of cross-laminated fine- to medium-grained sand, and at least 2 metres (6.5 feet) of poorly stratified and poorly sorted polymictic gravel. Many of the clasts in the lower gravel unit are partially decomposed. Bedrock was not exposed. The gradient of McIntyre Creek is steep.

Cross-laminated sand at the Peter Kiss Oilfied Construction Ltd. property at McIntyre Creek. Sand deposits such as this, which are probably glaciolacustrine, are found in many of the creeks between Johnson and Haggart Creeks.

Work at this property was begun in 1981 by Peter Kiss Oilfield Construction Ltd. A D9H bulldozer and a 225 backhoe were used to strip a large area, and prepare three large settling ponds. Little gravel was sluiced. T. Takis and E. Sevosik mined for part of the 1982 season, using a John Deere 350 bulldozer, and a JCB backhoe with .7 cubic metre (.9 cubic yard) bucket. They processed the gravel in a 45 cm (18 inch) wide sluice box 7.3 metres (24 feet) long. Water for sluicing was gravity-fed from a reservoir.

Wild Boar Enterprises **(29)**
Minto Creek **115 P 9**
1980, 1981 **63° 43'N, 136° 07'W**

This property is situated on the left limit of Minto Creek, approximately 1.4 km (.9 miles) downstream from Minto Lake. Deposits consist of 2.4 to 10.7 metres (8 to 35 feet) of poorly stratified glaciofluvial gravel with clasts up to 45 cm (18 inches) in diameter. The composition of the matrix of the gravel ranges from clayey to sandy to granular. The coarsest grained horizons are reported to contain the best gold values.

Processing unit at the Wild Boar Enterprises property at Minto Creek during 1980. The grizzly above the vibrating screening unit has been raised to clear it of boulders. The rotating drums are beneath the operator's platform. A generator to provide power for the processing unit is housed in the trailer.

Work at this site was done intermittently by a number of operators between 1958 and 1979. They encountered difficulties when the gold "floated" in the sluice box due to its shape and size, and was not recovered. Wild Boar Enterprises began work in 1980, using a "Mill-Spex" processing unit in an attempt to recover the gold. The gravel was mined by 5 people working with two 966 loaders, and fed over a grizzly and vibrating screening unit. Material less than 6 mm (.25 inch) in diameter was transported by conveyor to one of four drums. The drums rotated about a sub-horizontal axis, and the material was washed through them by a limited flow of water. Heavy grains were trapped by small ribs arranged in helical spirals inside the drums, and were prevented from being washed away by the rotation of the drums. The rate of rotation of the drums was slowed when necessary to allow the trapped concentrates to pass through the drums for collection. A cut approximately 18 metres (60 feet) wide, 75 metres (250 feet) long, and ranging from 2.4 to 9 metres (8 to 30 feet) deep was mined and processed in 1980. Work continued during 1981. A small sluice box was substituted for the revolving drums in 1981 in an attempt to improve gold recovery.

Gold from Minto Creek is reported to have a fineness of 827 to 835. It is fine-grained, flat, and very worn. In addition to gold, magnetite and hematite were recovered from the deposits at this site. The hematite was likely derived from the Snake River area, and was transported by glacial and glaciofluvial processes.

Peter Kiss Oilfield Construction Limited **(30)**
McLagan Creek **115 P 9**
1981 **63° 42'N, 136° 14'W**

This property is situated along McLagan Creek, approximately 2 km (1.3 miles) upstream from its mouth at Minto Lake. The creek valley is approximately 150 metres (500 feet) wide, but it has a steep gradient. The deposits vary depending upon their elevation, but in general consist of 2 metres (6.5 feet) or more of laminated sand, gritty sand, and pebbly sand overlying 2 metres (6.5 feet) or more of coarse, polymictic gravel with boulders up to 60 cm (24 inches) in diameter. The sand and gravel appear to be part of a blanket of unconsolidated deposits which once mantled the Minto Creek valley to approximately the elevation of these workings, but which has subsequently been almost completely eroded. Bedrock is blocky weathering quartz schist.

Work was done at this location in 1981 using a D8K bulldozer, a 966 loader, and a single-channel sluice box 90 cm (3 feet) wide and 8.5 metres (28 feet) long with grizzly. Three settling ponds were used to impound sluicing water.

M. Stewart **(31)**
McLagan Creek **115 P 9**
1982 **63° 42'N, 136° 14'W**

This property is situated along McLagan Creek approximately 2.2 km (1.4 miles) upstream from its mouth at Minto Lake. A small cut approximately 2 metres (6.5 feet) deep was previously mined in the center of the valley at this location. Deposits consist of .3 metres (1 foot) of muck overlying 6 metres (20 feet) of coarse gravel with clasts up to 60 cm (24 inches) in diameter.

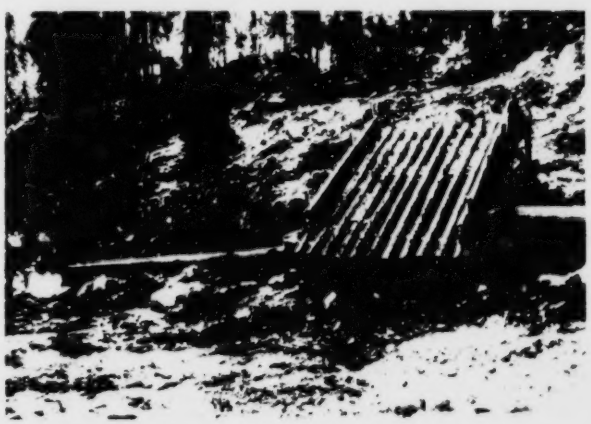
Two people worked in 1982 using a Case 530 loader-backhoe with .6 cubic metre (.75 cubic yard) bucket. The material mined was processed in a 35 cm (14 inches) wide wooden sluice box 7.3 metres (24 feet) long with wooden grizzly.

Gold recovered at this property was flat and appeared worn, although gold from the lower part of the section appeared less worn than that from the upper part of the section.

M. Pilote **(32)**
McLagan Creek **115 P 9**
1981 **63° 42'N, 136° 14'W**

This property is situated along McLagan Creek, approximately 2.4 km (1.5 miles) upstream from its mouth at Minto Lake. There were 1.2 to 1.8 metres (6 to 8 feet) of coarse gravel exposed in the cut at this location. Bedrock was not reached.

M. Pilote worked with a D4 bulldozer, and small wooden sluice box with wooden grizzly in 1981. Water for sluicing was gravity-fed.



Wooden grizzly and sluice box at the M. Pilote property, McLagan Creek.

W. Tuck **(33)**
Carlson Creek **115 P 9**
1978, 1979, 1980 **63° 42'N, 136° 18'W**
1981, 1982

This property is situated along the upper reaches of Carlson Creek in a narrow valley with steep gradient. The deposits consist of 1 metre (3 feet) or less of muck overlying 2 to 6 metres (6 to 20 feet) of colluvium and 3.5 metres (12 feet) of gravel. The character of the gravel varies. In some sections it is clast supported and imbricated with equant to elongate sub-round boulders up to 40 cm (16 inches) in diameter with silty to sandy matrix. In other sections, flat, angular clasts of schist up to 30 cm (12 inches) in diameter are present in stratified sandy

matrix supported gravel. The relationship between the two types of gravel could not be determined in the exposed sections. The deposits are not frozen. Bedrock is decomposed sericite schist.

Test work began on Carlson Creek in 1975. Two people worked at the property part time in 1978, 1979, and 1980. They did stripping, and other preparatory work. In 1981, two people worked full time from mid-July until September with a D8H bulldozer, and a Clark 75A loader with a 2.3 cubic metre (3 cubic yard) bucket. They did additional stripping, dug a bedrock drain, and mined a small cut. Work continued in 1982, when approximately 12,000 cubic metres (15,500 cubic yards) of material were moved. Water for sluicing was gravity fed from the flow of Carlson Creek.

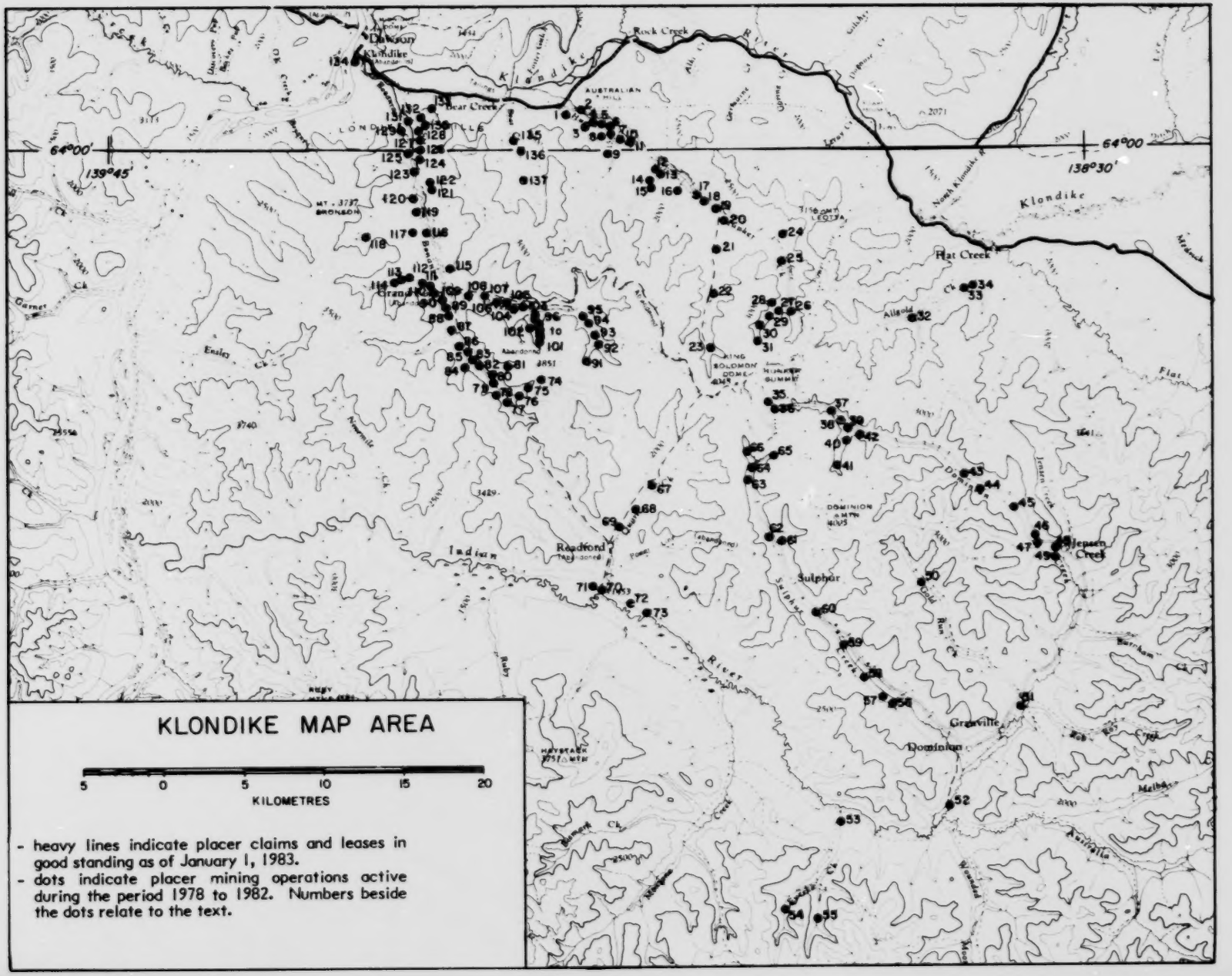
View downstream along Carlson Creek at the W. Tuck mining operation.

P. Tierman
R. Holway
D. Duensing
Bear Creek
1979, 1980, 1981

(34)
115 P 9
63° 40'N, 136° 22'W

This property lies in a narrow, steep sided valley along the upper reaches of Bear Creek. The area is at the margin of the region affected by glaciation.

Mr. Tierman began work on the property in 1979. He was joined by Messrs Holway and Duensing in 1980. They worked with a D8 bulldozer and a 966 loader. Work done included mining, and construction of a bedrock drain. They continued working in 1981 with the D8 bulldozer and two loaders. A "Derocker" classification system was used to remove all material coarser than 5 cm (2 inches) from the gravel prior to sluicing.


64°00'
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Dawson
Klondike
Rock Creek
Klondike
Bear Creek
Australian Hill
Flat Creek
Allgold
Grand Forks
Eureka Ck
Garner Ck
Indian
Radford
Sulphur
Jensen Creek
Dominion
Granville
Australia
Hayward
Ruby
Ruby River
Flat
Barnham Ck
Melba
Bonanza Ck
Hunker Summit
King Solomon Dome
Dominion Mtn
Mt. Bronson
North Klondike R.
Klondike
KLONDIKE MAP AREA
5 0 5 10 15 20
KILOMETRES
- heavy lines indicate placer claims and leases in good standing as of January 1, 1983.
- dots indicate placer mining operations active during the period 1978 to 1982. Numbers beside the dots relate to the text.

PLACER MINING OPERATIONS IN THE KLONDIKE AREA, PARTS OF 115 O/N and 116 B/C

K. Tatlow (1)
4-M Mining 116 B 3
Hunker Creek (Klondike)
1978, 1979, 1980 64° 01'N, 139° 10'W
1981, 1982

This property is located along the left limit of Hunker Creek, approximately 3.7 km (2.3 miles) upstream from its present confluence with Klondike River. It is situated along the margin of tailings from early dredging operations, and includes the wedge of unconsolidated deposits at the foot of the left limit slope. Deposits consist of 18 metres (60 feet) or more of black muck overlying .6 to 2.4 metres (2 to 8 feet) of gravel. The black muck is silty, and ice-rich, and contains abundant organic material including roots, tree branches, and tree trunks, along with occasional fossil bones of Pleistocene mammals including bison, wild ass, horse, mastodon, mammoth, and smaller animals. Elsewhere in the Klondike area, such fossil bones have been shown to be from 22,000 to 40,000 years old. The underlying gravel thickens away from Hunker Creek. The gravel may mark the edge of an old, buried channel of the creek. Bedrock is schist. It is decomposed in part.

K. Tatlow and family worked at this property during 1978 and 1979. They used one D8 bulldozer, and five monitors. The monitors directed water under pressure against the black muck to thaw it and wash it away. Two cuts totalling 3,500 square metres (37,600 square feet) in area were mined in 1978, and a similar area was mined in 1979. The property was taken over in 1980 by 4-M Mining. Three people worked using a D4 bulldozer, a D9G bulldozer, and monitors. Two small cuts totalling 750 square metres (8,050 square feet) in area were mined, and stripping and other work were done. Tailings from the hydraulic stripping of muck were impounded in old dredge tailings along Klondike River. Work continued in 1981 and 1982.

J. Hua (2)
Hunker Creek 116 B 3
1982 (Klondike)
64° 01'N, 139° 09'W

This property is situated along the right limit of Hunker Creek, opposite the mouth of Henry Gulch. It lies on a bench 3 metres (10 feet) above the present creek level at the margin of old dredge tailings. Deposits on the bench are varied. They include a section 2.4 metres (8 feet) thick of sandy gravel with well developed cross-bedding and clasts up to 10 cm (4 inches) in diameter, a section 7.5 metres (25 feet) thick with 3 metres (10 feet) of laminated silt overlying 1.5 metres (5 feet) of sandy gravel with clasts up to 10 cm (4 inches) in diameter and 3 metres (10 feet) of laminated silt with manganese stain, and a section 7.5 metres (25 feet) thick with well rounded quartz pebbles in an earthy matrix. The unit consisting of quartz pebbles in the earthy matrix probably represents colluvium at the base of the Hunker valley slope, with the quartz pebbles derived from adjacent Australian Hill.

Work at this location was done by J. Hua in 1982. A D8H bulldozer and Trojan loader were used. Several small test pits were mined.

J. Alton (3)
Henry Gulch 116 B 3
1981, 1982 (Klondike)
64° 01'N, 139° 09'W

This property is situated along Henry Gulch, just upstream from its confluence with Hunker Creek. Deposits consist of 3.6 to 7.6 metres (12 to 25 feet) of black muck overlying 1.8 metres (6 feet) of gravel.

J. Alton worked at this location in 1981 using a D8K bulldozer during the first half of the season, and the bulldozer and a loader during the second half of the season. He stripped and mined an area of approximately 750 square metres (8,000 square feet). He did a limited amount of work on the property in 1982 using the D8K bulldozer, and a Michigan loader with 1 cubic metre (1.25 cubic yard) bucket.

Gold from Henry Gulch is reported to have a fineness of 605 to 650.

J. Hanulik (4)
Hunker Creek 116 B 3
1978, 1979, 1980 (Klondike)
1981, 1982 64° 01'N, 139° 08'W

This property is leased from Miben Mining Company by J. Hanulik. It is situated along a low left limit bench of Hunker Creek, at the foot of the north side of Dago Hill. Deposits consist of a wedge of black muck and gravel from 1.5 metres (5 feet) to 6 metres (20 feet) or more thick. The gravel contains clasts of quartz, quartzite, and quartz-muscovite schist. Bedrock is chlorite schist.

Mr. Hanulik worked at this property each season from 1978 to 1982, using a D7E bulldozer, and a single channel sluice box 90 cm (3 feet) wide and 10.7 metres (35 feet) long. He stripped approximately 6,560 cubic metres (7,400 cubic yards) of material and mined and sluiced an additional 1,400 cubic metres (1,850 cubic yards) of material each year.

Miben Mining Company (5)
J. Simcox 116 B 3
G. Lee (Klondike)
T. Gilchrist 64° 01'N, 139° 07'W
Preido Mines Ltd.
Main Street Mining
Hunker Creek
1978, 1979, 1980
1981, 1982

This property is situated on the north side of Dago Hill, a bench along the left limit of Hunker Creek. Deposits are 18 to 24 metres (60 to 80 feet) thick and

consist of matrix-supported White Channel gravel with clasts up to 15 cm (6 inches) in diameter. The clasts are rounded, and consist of quartz, quartz-sericite schist, and quartz-feldspar prophyry. Many schist and prophyry clasts, especially those near bedrock, are completely decomposed. They disintigrate when removed from the frozen gravel and allowed to thaw. Bedrock, which is quartz-sericite schist, is also decomposed. Several sub-horizontal thrust faults cut the gravel.

Miben Mining Company was active at this property in 1978. Two people worked using a high pressure pump and monitor to wash down gravel from the deep cut. Water, and a D6 bulldozer, a D7 bulldozer, and a rubber-tired bulldozer were used to move the gravel to two sluice boxes. Long, narrow wooden flumes carried tailings from the ends of the sluice boxes to discharge points at the edge of Dago Hill. Work continued during 1979, and part of 1980. Approximately 49,500 cubic metres (65,000 cubic yards) were mined from an irregular cut in 1980. Sluicing was done at a rate of 95 cubic metres (125 cubic yards) per hour. Mining at this property in 1981 was done underground. The gold-bearing gravel near bedrock was mined, while the barren gravel 3 metres (10 feet) and more above bedrock was not mined. J. Simcox, G. Lee, T. Gilchrist, and one helper worked on two shifts using a two-boom drill jumbo, a 630 compressed air mucking machine, and two compressed-air powered locomotives with side dumping cars of 3.8 cubic metres (5 cubic yards) capacity on tracks. The frozen gravel was drilled and blasted, and then removed from the workings and stockpiled prior to sluicing. Two rounds were drilled and blasted per shift. Each loosened approximately 27 cubic metres (35 cubic yards) of gravel. The work was done in summer. A large refrigeration unit, and doors closing the workings were, however, not sufficient to keep the temperature inside the workings below freezing. The result was that the gravel thawed, and was not competent to support itself. Mining was stopped, and the workings were sealed. The gravel mined was sluiced in the sluice boxes formerly used by Miben Mining Company. Preido Mines Ltd. worked at this property for part of the summer during 1982. Mining was done on surface, using a D9 bulldozer, a 980 loader, and a 235 backhoe. The upper 15 metres (50 feet) of gravel were stripped, and the lower 3 metres (10 feet) were mined and processed through a vibrating screening unit and sluice box. Water for sluicing was pumped from Hunker Creek. Underground mining was again done during 1982. Main Street Mining worked during the winter to avoid problems with thawing.

Portal of underground mining operation at Dago Hill during 1981. The miner is using a compressed air-powered locomotive and side-dumping car on tracks to haul gravel to a stockpile.

Gold from Dago Hill is reported to have a fineness of 798 to 859. Some of it has poorly developed "chevron" form crystalline structure. Botryoidal cassiterite (wood tin) is also recovered from Dago Hill.

P. Favron **(6)**
S. Favron **116 B 3**
Last Chance Creek **(Klondike)**
1980, 1981 **64° 01'N, 139° 07'W**

This property is located on a low bench at the foot of Dago Hill. It lies along the left limit of Last Chance Creek, at its confluence with Hunker Creek. Deposits present include tailings from the former workings of F. Schneider, and an undisturbed section of 1.2 metres (4 feet) of black muck overlying 0 to 1.2 metres (0 to 4 feet) of gravel.

Two people worked at this location in 1980, using a Terex 8230 bulldozer. A D9 bulldozer was also used occasionally, to rip the black muck. A section of 930 square metres (10,000 square feet) of old tailings, and another section of 4,650 square metres (50,000 square feet) of previously unworked deposits were mined. The material was processed in a 108 cm (43 inches) wide sluice box 18.3 metres (60 feet) long. Panels of grader blade installed over angle iron riffles in the floor of the sluice box were set with abrupt steps 15 cm (6 inches) high at their downstream ends, so that clay balls would be broken up during sluicing. Work continued at this property during part of the 1981 mining season.

H. Hanulik **(7)**
Hunker Creek **116 B 3**
1981, 1982 **(Klondike)**
64° 01'N, 139° 07'W

This property is located along the left limit of Last Chance Creek, at the foot of Dago Hill. Deposits consist of 6 to 9 metres (20 to 30 feet) of tailings from earlier mining on Dago Hill.

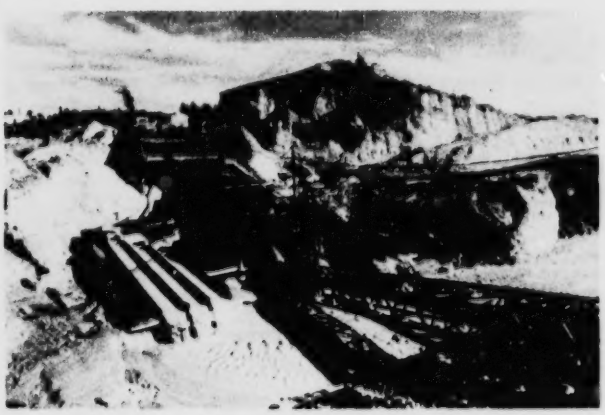
Two people worked at this site using one 955 loader, and a 60 cm (2 feet) wide sluice box 5.5 metres (18 feet) long during 1981. Water for sluicing was recirculated from the settling pond of Miben Mining Company. The same equipment was used to continue work in 1982.

Miben Mining Company **(8)**
Hunker Creek **116 B 3**
Last Chance Creek **(Klondike)**
1979, 1980 **64° 00'N, 139° 07'W**
1981, 1982

This property is situated on the southeast side of Dago Hill, a bench along the left limits of Hunker and Last

Chance Creeks. Deposits are up to 50 metres (165 feet) thick, and consist of matrix-supported White Channel gravel with clasts up to 15 cm (6 inches) in diameter. Bedrock is quartz-sericite and carbonaceous schist. It is badly decomposed. A more complete description of the deposits at this location is given by D. Tempelman-Kluit in D.I.A.N.D. Yukon Geology and Exploration, 1981.

Preparatory work at this location was begun in 1979. Six people worked in 1980, using one D6 bulldozer, one D7E bulldozer, two D9G bulldozers, one 824B rubber-tired bulldozer, a small Case loader, and a 992B loader with 7.6 cubic metre (10 cubic yard) bucket. Six metres (20 feet) of gravel were stripped from an area of 185 by 245 metres (600 by 800 feet) and 12 metres (40 feet) of gravel were mined from an area 45 by 60 metres (150 by 200 feet), and sluiced. Gravel to be sluiced was pushed by bulldozer into a hopper, from which water washed it over a short sluice and into a rotating trommel 1.8 metres (6 feet) in diameter, and 8.5 metres (28 feet) long. Grains less than 2.5 cm (1 inch) in diameter passed through the trommel, and dropped through a slot running the length of the panel under the trommel into a long, narrow nugget trap. Overflow from the nugget trap was divided between a series of sluice boxes on either side of the trommel. Tailings from the sluice boxes were directed along a bedrock drain, and dumped over the side of Dago Hill. Overside from the trommel passed onto a 75 cm (30 inches) wide conveyor belt 137 metres (450 feet) long, and was transpo. ted to a tailings pile on Dago Hill. The trommel was acquired from Dredge 8, on Sulphur Creek, and the sluices were acquired from a sister dredge, Dredge 10, on Dominion Creek. The conveyor was acquired from Cassiar Asbestos Corp. when their mine at Clinton Creek closed. Water for sluicing was pumped from Hunker Creek. A 300 horsepower generator provided electricity to run the trommel and conveyor. Work at this location continued in 1981 and 1982.



Processing unit at Miben Mining Company operation at Dago Hill during 1981. Gravel from the hopper being fed by the bulldozer at top left is washed into the trommel, from which oversized material is transported to tailings by the conveyor belt in the foreground, and undersized material is sluiced in the parallel sets of sluice boxes. This processing unit was built from parts salvaged from two old dredges, and an asbestos mine.

I. Bremner (9)
Last Chance Creek 115 O 14
1978, 1979, 1980 (Klondike)
1981, 1982 64° 00'N, 139° 07'W

This property is located on Bryan Bench of Discovery Hill, along the left limit of Last Chance Creek. Deposits are up to 10.5 metres (35 feet) thick, and consist of White Channel gravel with quartz boulders up to 30 cm (12 inches) in diameter, overlain by a thin layer of yellow-brown gravel.

I. Bremner and one helper worked each year from 1978 to 1982. They used no heavy equipment. Water from the Last Chance Creek ditch was used to wash material down from the gravel face and into a long, narrow wooden sluice box. Coarse boulders were broken with a sledge hammer, and washed through the sluice box with the rest of the gravel. Tailings were disposed of over the side of Discovery Hill.

Hydraulic mining at the I. Bremner property on Bryan Bench of Last Chance Creek. Large boulders in the foreground were picked from the gravel and stacked by hand. The head of the sluice box set in the floor of the cut is visible at lower right.

Preido Mines Ltd. (10)
Last Chance Creek 116 B 3
Hunker Creek (Klondike)
1981, 1982 64° 00'N, 139° 06'W

This property is located on Preido Hill, along the right limit of Last Chance Creek near its mouth. Deposits consist of approximately 18 metres (60 feet) of White Channel gravel lain down by a precursor of Hunker Creek.

Work at this site began in 1981. Four people mined using a D9 bulldozer, a 980C loader, and a 235 hoe. They built a water reservoir on Last Chance Creek, and two settling ponds on Preido Hill. Some water for sluicing was recirculated. Work continued in 1982 for part of the season.

T. Kosuta (11)
Savoya Hill Mines 116 B 3
Northwest Consolidated Industries Ltd. (Klondike)
Hunker Creek 64° 00'N, 139° 05'W
80 Pup
1978, 1979, 1980
1981, 1982

This property is situated along 80 Pup at, and upstream from its confluence with Hunker Creek, and along the left limit of Hunker Creek, upstream from the mouth of 80 Pup. Deposits at 80 Pup consist of 6 to 9 metres (20 to 30 feet) of black muck overlying 1.5 to 1.8 metres (5 to 6 feet) of gravel. Deposits along the left limit of Hunker Creek consist of up to 23 metres (75 feet) of black muck overlying 1.2 metres (4 feet) of gravel along a low level bench, and 9 to 12 metres (30 to 40 feet) of White Channel gravel on Savoya Hill (the high bench between 80 Pup and Hunker Creek).

T. Kosuta began work on 80 Pup in 1968. He continued in 1978, when he stripped an area 9 metres (30 feet) wide, 12 metres (40 feet) long, and 9 metres (30 feet) deep, using a D7 bulldozer. In 1979, he used the D7 bulldozer, a tracked loader, and a metal sluice box 90 cm (3 feet) wide and 6 metres (20 feet) long to mine and sluice the area stripped in 1978. He then moved to the mouth of 80 Pup, and stripped tailings from earlier workings. Savoya Hill Mines did hydraulic stripping of part of the section of White Channel gravel on Savoya Hill during 1979. Water was pumped approximately 105 metres (350 feet) uphill from Hunker Creek for this purpose. The company worked at the mouth of 80 Pup in 1980, using two Terex bulldozers, a loader, and a backhoe. Northwest Consolidated Industries Ltd. subcontracted for Savoya Hill Mines in 1981 and 1982. A D8H bulldozer, a Terex 8240 bulldozer, a 988 loader, and a Han-Werner backhoe were used to mine on the low left limit bench along Hunker Creek.

F. Oblak (12)
Hunker Creek 115 O 14
1978, 1979, 1980, (Klondike)
1981, 1982 63° 59'N, 139° 03'W

This property is located on Paradise Hill, a bench along the left limit of Hunker Creek approximately 100 metres (325 feet) above its present elevation. Deposits present consist of up to 4.5 metres (15 feet) of yellow-brown gravel overlying 15 metres (50 feet) of White Channel gravel. Quartz boulders in the gravel are up to 45 cm (18 inches) in diameter, especially near the base of the section. Bedrock is carbonaceous schist.

F. Oblak worked by hand at this location during parts of the 1978 to 1982 summers. Deposits at the site of his workings are approximately 6 metres (20 feet) deep.

T. Kosuta (13)
Hester Creek 115 O 14
1982 (Klondike)
63° 59'N, 139° 03'W

This property is located along Hester Creek, approximately 450 metres (1,500 feet) upstream from its confluence with Hunker Creek. Deposits consist of several metres of black muck overlying 1 to 2 metres (3.3 to 6.6 feet) of gravel.

Work at this site was done by three people using three bulldozers and a loader in 1982. The black muck was stripped, and gravel was mined and sluiced.

L. Perunovic (14)
G. Crawford 115 O 14
Hunker Creek (Klondike)
1981, 1982 63° 59'N, 139° 03'W

This property is located on a high level bench along the left limit of Hester Creek. Deposits consist of several metres of yellow-brown Klondike gravel and laminated silt, overlying several metres of White Channel gravel. The deposits are contiguous with those on Paradise Hill along Hunker Creek, over 1,000 metres (3,250 feet) to the northeast. Bedrock is badly decomposed carbonaceous schist.

Gold-bearing gravel was found at this location in 1981 by L. Perunovic who mined by hand. Exploration and testing was done by up to six people headed by G. Crawford in 1982. One D9H bulldozer, a 980C loader and a 627 scraper-loader were used for stripping and to dig test pits. Bulk samples were processed through a vibrating screening unit, and sluice box.

T. Fritz (15)
Hester Creek 115 O 14
1981, 1982 (Klondike)
63° 59'N, 139° 04'W

This property is situated near the mouth of an unnamed small, moderately steep, left limit tributary of Hester Creek. Deposits present consist of a layer of black muck of variable thickness overlying clast supported sandy gravel. Bedrock was not exposed.

T. Fritz worked alone at this location in 1981 and 1982, using a D8 bulldozer, and a small John Deere backhoe.

Klondike Vault Placers (16)
D. Laurenson 115 O 14
Independence Creek (Klondike)
1980, 1982 63° 59'N, 139° 01'W

This property is situated along Independence Creek, approximately 450 metres (1,500 feet) upstream from its confluence with Hunker Creek. Deposits present include tailings from former mining operations, and gravel overlain by black muck. Much of the area has been mined previously by open cut methods.

Klondike Vault Placers did a limited amount of stripping and testing at this location in 1980. Two people worked, using a 970 loader, and 70 cm (28 inch) wide sluice box 7.3 metres (24 feet) long. The property was leased in 1982 to D. Laurenson, who worked with one D6 bulldozer for one month. Water for sluicing was gravity-fed.

D. Gould (17)
Hunker Creek 115 O 15
1981, 1982 (Klondike)
63° 58'N, 139° 00'W

This property is located along Hunker Creek, just upstream from the mouth of Colorado Creek. The creek valley is relatively narrow at this point due to a ridge of resistant chloritic schist along the left limit. Deposits on a left limit bench 9 metres (30 feet) above the present creek level, and just downstream from the bedrock ridge consist of up to 9 metres (30 feet) of cross-cutting and discontinuous layers of colluvium, parallel laminated sand and pebbly sand with rounded clasts, and matrix-supported gravel with angular clasts. The bedrock surface slopes into the left limit bank. Old underground workings were found on this bench. Deposits in Hunker Creek consist of dredge tailings from 1916 or 1917 dredge mining. The tailings are frozen in places.

Work at this site was done by two people using a D3 bulldozer in 1981. They mined a cut along the left limit bench. Two people continued work using the D3 bulldozer in 1982, but in 1982 old dredge tailings were mined.

J. Gould (18)
Hunker Creek 115 O 15
1980, 1982 (Klondike)
63° 58'N, 139° 00'W

This property is situated along Hunker Creek, approximately 375 metres (1,250 feet) downstream from the mouth of Not Much Gold Creek. Deposits present on a low left limit bench in a broad, north facing amphitheatre comprise a sequence at least 4.5 metres (15 feet) thick of discontinuous colluvium, black muck, and gravel layers. Tailings from old underground mining operations on the bench deposits are present. Deposits present in Hunker Creek consist of dredge tailings from 1916 or 1917 dredge mining.

Work at this location was done on the bench deposits in 1980. A small cut of approximately 150 square metres (1,600 square feet) was mined, and several test pits were dug. A metal sluice box 60 cm (24 inches) wide and 6 metres (20 feet) long was used to process the material mined. A D4 bulldozer and the same sluice box were used by two people in 1982, when old dredge tailings were mined.

Gold from the middle portion of Hunker Creek is reported to have a fineness of 725 to 820.

J. Fraser (19)
A. Close 115 O 15
Hunker Creek (Klondike)
1979, 1980, 63° 58'N, 138° 59'W
1981, 1982

This property is located on a low left limit bench along Hunker Creek, approximately 750 metres (2,500 feet) downstream from the mouth of Gold Bottom Creek. Deposits present consist of up to 10.7 metres (35 feet) of ice-rich black muck overlying up to 1.5 metres (5 feet) of gravel. Bedrock is decomposed quartz-sericite schist. Several shafts and at least three old drifts from previous underground mining operations are present at this site. A thin, discontinuous layer of tailings from former hydraulic mining operations on Temperance Hill is also present.

J. Fraser and A. Close began work at this property in 1979. They used water under pressure to wash down the black muck, and two D4 bulldozers to mine the underlying gravel. The same equipment was used in 1980 to mine a cut approximately 15 metres (50 feet) wide, and 30 metres (100 feet) long. Work continued in 1981. It became apparent that the bedrock rose from the present level of the creek, and then dropped off again leaving a bedrock ridge between Hunker Creek and a previous channel approximately 9 metres (30 feet) above the present one. One D4 and one D6 bulldozer were used along with water by two people to mine in 1982. Two people began work at a second operation approximately 150 metres (500 feet) downstream from the original workings on this property in 1982. They used water under pressure and two D4 bulldozers to mine similar left limit bench deposits.

Gold Bottom Placers (20)
Gold Bottom Creek 115 O 15
1978, 1979, 1980 (Klondike)
1981, 1982 63° 57'N, 138° 58'W

This property is located along Gold Bottom Creek, just upstream from its confluence with Hunker Creek. Deposits are 5.5 to 6.7 metres (18 to 22 feet) thick and consist of 4 to 5.5 metres (13 to 18 feet) of colluvium and black muck overlying 1.2 to 1.5 metres (4 to 5 feet) of sandy gravel. Colluvium with abundant slabs of bedrock is thickest along the right limit of the creek. Deposits along the right limit of the creek are frozen, while those in the center of the valley and along the left limit are not. Bedrock is chlorite schist. Old underground workings are present along the left limit.

Work at this property by Gold Bottom Placers began in 1976. In 1978, a dragline was used to dig a bedrock drain. Other preparatory work, and a limited amount of mining were also done. Work continued in 1979. Five metres (16 feet) of black muck was stripped from a cut of 1,100 square metres (12,000 square feet), and 1.8 metres (6 feet) of gravel and bedrock were mined and sluiced. One D7 bulldozer, three D8 bulldozers, and a dragline with 1 cubic metre (1.25 cubic yard) capacity were used to strip and mine a cut of 3,050 square metres (33,000 square feet). Stripping was done on a second cut of 15,250 square metres (50,000 square feet). A narrow cut was also mined along the left limit of Hunker Creek, just upstream from the mouth of Gold Bottom Creek in 1980. Two people continued work on the property in 1981, using two D8 bulldozers, and a Koehring 666 backhoe with 1.5 cubic metre (2 cubic yard) bucket. One bulldozer pushed material to the sluice box, which was fed by the hoe. The second bulldozer pushed tailings away from the sluice box. Two cuts, each approximately 55 metres (180 feet) wide, and totalling 6,700 square metres (72,000 square feet) were mined. Two D8H bulldozers and the Koehring hoe were used to mine two more cuts totalling 6,700 square metres (72,000 square feet) in 1982. The cuts were from 6 to 6.7 metres (20 to 22 feet) deep. A third cut was stripped in preparation for mining in 1983.

Gold from Gold Bottom Creek is reported to have a

fineness of 780 to 800. Magnetite, and a limited amount of pyrite are also recovered from the creek.

O. Lunde (21)
Gold Bottom Creek 115 O 15
1978, 1979, 1980, (Klondike)
1981, 1982 63° 57'N, 138° 59'W

This property is located along Gold Bottom Crek, approximately 2,500 metres (8,200 feet) upstream from its confluence with Hunker Creek, and just upstream from the mouth of Soda Pup. Deposits in the broad valley are from 2.7 to 5.8 metres (9 to 19 feet) thick, and consist of 1.8 to 4.3 metres (6 to 14 feet) of black muck overlying .9 to 1.5 metres (3 to 5 feet) of clast-supported gravel. Clasts are imbricated, and usually less than 15 cm (6 inches) in diameter although a few large quartz boulders are present. Bedrock is slightly to badly decomposed quartz-sericite schist. Old workings are present along the left limit of the creek.

O. Lunde began work on Gold Bottom Creek in 1962. In 1978, he mined two cuts totalling approximately 4,200 square metres (45,000 square feet). Black muck was stripped partly by diverting the creek over it, and partly by bulldozer. The gravel, and approximately .6 metres (2 feet) of the underlying bedrock were mined and sluiced. Work continued in 1979. In 1980, two people using a D6C bulldozer and a 977H tracked loader mined two cuts totalling 4,100 square metres (44,000 square feet). Water for sluicing was diverted from Gold Bottom Creek and Soda Pup to a holding pond, and gravity-fed when needed. The sluice box was 60 cm (24 inches) wide, and 7.3 metres (24 feet) long. Mr. Lunde worked alone for most of 1981, but had one helper while sluicing. He used a D7 bulldozer to mine a cut of approximately 2,800 square metres (30,000 square feet), and did ground preparation work for 1982 mining. In 1982, he used the D7 bulldozer to mine two cuts totalling 4,650 square metres (50,000 square feet).

Abundant well rounded magnetite grains up to 2 mm (.1 inch) in diameter are recovered from deposits at this site.

M. Crockett (22)
Gold Bottom Creek 115 O 15
1978, 1979, 1980 63° 55'N, 138° 59'W

This property is located along the middle portion of Gold Bottom Creek. Deposits consist of approximately 2 metres (7 feet) of gravel. Bedrock is decomposed schist. The bedrock surface is irregular.

Mr. Crockett began work on Gold Bottom Creek in 1967. In 1978, he stripped approximately 1 metre (3 feet) of gravel, and mined and sluiced the remaining gravel and .5 metre (1.5 feet) of bedrock in each of four cuts on claim 38. The cuts were 40 metres (130 feet) wide and 30 metres (100 feet) long, and totalled 4,850 square metres (52,000 square feet). Work continued in 1979. In 1980, Mr. Crockett moved approximately 1,300 metres (4,250 feet) downstream to claim 30, where he worked using one D8 bulldozer. He mined five cuts, each the width of the valley and 30 metres (100 feet) long, totalling 5,750 square metres (62,000 square feet).

B & H Mining (23)
Gold Bottom Creek 115 O 15
1979, 1980, (Klondike)
1981, 1982 63° 53'N, 138° 59'W

This property is located along the upper portion of Gold Bottom Creek, at the mouth of Soap Creek. Deposits are 4.3 to 5.5 metres (14 to 18 feet) thick, and consist of 2.4 to 3 metres (8 to 10 feet) of colluvium and muck overlying 1.8 to 2.4 metres (6 to 8 feet) of brown, silty gravel. Parts of the gravel section have rounded clasts, while other parts have flat, angular clasts. Bedrock is highly decomposed chlorite schist.

Work at this location was begun by B. Rouleau in 1979. Preparations for future mining were done. Mr. Rouleau worked alone in 1980 using one D7 bulldozer, one International bulldozer, and a Michigan 55A loader with .75 cubic metre (1 cubic yard) bucket. He constructed a water reservoir above his cut, and a settling pond below it. Water from the settling pond was recirculated when needed for sluicing. Two small cuts totalling 650 square metres (7,000 square feet) were mined. Two people worked at this site using the same equipment in 1981. They stripped and mined a cut of approximately 2,300 square metres (24,750 square feet). Two people used the D7 and International bulldozers, and a 977 tracked loader in 1982 to mine another cut of approximately 2,300 square metres (24,750 square feet).

G. Shaw (24)
Rogers Gulch 115 O 15
1978, 1979, 1980, (Klondike)
1981, 1982 63° 57'N, 138° 54'W

This property is situated along Rogers Gulch (6 Below Pup), a right limit tributary of Hunker Creek immediately upstream from Whiskey Hill. Deposits present are 6 to 7.5 metres (20 to 25 feet) thick, and consist of 4.5 to 6 metres (15 to 20 feet) of frozen colluvium and black muck with abundant roots, overlying 1.5 metres (5 feet) of sandy gravel. Bedrock along the centre of the creek and the left limit is quartz-sericite schist, but along the right limit it is

G. Shaw using a monitor with gravity-fed water to strip black muck from his property at Rogers Gulch.

foliated equigranular hornblende diorite. Open-cut mining has previously been done along the right limit of the creek.

G. Shaw began work at this location in 1976, wen he constructed a water reservoir to provide gravity-fed water for hydraulic stripping, and sluicing. Mr. Shaw mined a small cut along the left limit of Rogers Gulch in 1978. He continued work in 1979, using a Case 350 bulldozer to loosen overburden, and water to wash it away prior to mining the underlying gravel with the bulldozer. The gravel was processed through a sluice box 60 cm (2 feet) wide and 2.4 metres (8 feet) long. A cut of approximately 250 square metres (2,700 square feet) was mined. The same equipment and methods were used to strip and mine cuts of similar size in 1980 and 1981. In 1982, Mr. Shaw and one helper used the Case 350 bulldozer, and a Hough loader with 1 cubic metre (1.25 cubic yards) bucket to mine approximately 900 cubic metres (1,200 cubic yards) of old tailings from Whiskey Hill which were piled along the right limit of Rogers Gulch. A small cut was also mined along the left limit of the creek.

J. Erickson (25)
H. Liedtke 115 O 15
Hunker Creek (Klondike)
1978, 1979, 63° 56'N, 138° 54'W

This property is situated along the upper portion of Hunker Creek and extends approximately 450 metres (1,500 feet) upstream and downstream from the Hunker Creek Discovery claim. Deposits present are 3.4 to 7.5 metres (11 to 25 feet) thick, and consist of 1.8 to 5 metres (11 to 20 feet) of ice-rich black muck overlying 1.6 metres (5 feet) of gravel. The deposits lie on the right and left limits of the creek, along the margins of tailings from 1917 dredging operations. Bedrock is slightly to badly decomposed quartz-sericite schist. The bedrock surface is irregular.

J. Erickson and H. Liedtke used a D8 bulldozer, and a 977 tracked loader to mine a cut approximately 30 metres (100 feet) wide, 150 metres (500 feet) long, and 6 metres (20 feet) deep along the right limit of claim 3 Below Discovery during 1978. They moved upstream to the mouth of Mint Gulch in 1979, and used the D8 bullozer, the 977 tracked loader, and a dragline with 1.1 cubic metre (1.5 cubic yards) capacity to mine along the left and right limits of the creek. The same equipment was used to continue work at this location in 1980, when cuts approximately 6 metres (20 feet) wide, 230 metres (760 feet) long, and 3.5 metres (12 feet) deep were mined along the right and left limits. The gravel was processed through a sluice box 60 cm (24 inches) wide and 7.3 metres (24 feet) long. A cut of approximately 4,150 square metres (44,500 square feet), and averaging 7.6 metres (25 feet) deep was mined by J. Erickson and H. Liedtke in 1981. The same equipment as in previous years was used to strip the muck, and mine and sluice the underlying gravel.

R. Ukrainetz (26)
Hunker Creek 115 O 15
1980, 1981 (Klondike)
63° 54'N, 138° 53'W

This property is located on the Right Fork of Hunker Creek, approximately 300 metres (1,000 feet) upstream from its confluence with the Left Fork of Hunker Creek. Numerous old shafts are present in the area, although there were apparently no extensive underground mining operations. Deposits at this site are reported to be 8.2 metres (27 feet) thick.

Work was begun in 1980, when two bulldozers and a loader were used to do stripping. Ground preparation work continued in 1981, when 1.8 to 2.4 metres (6 to 8 feet) of muck were stripped from a cut 45 metres (150 feet) square along the left limit of the creek. In October, 1981, Mr. Ukrainetz was struck by a piece of flying metal and killed when a steam boiler he was using exploded.

D. Gritzka (27)
Magnum Enterprises 115 O 15
Hunker Creek (Klondike)
1981, 1982 63° 54'N, 138° 54'W

This property is situated along the Right Fork of Hunker Creek, approximately 600 metres (2,000 feet) upstream from its confluence with the Left Fork, and just upstream from the limit of dredging on Hunker Creek. Old underground workings are, however, present. Deposits are up to 9 metres (30 feet) thick, and consist of 6 metres (20 feet) of ice-rich black muck overlying 1.5 to 3 metres (5 to 10 feet) of gravel. The gold-bearing gravel is reported to be the lowermost .5 metres (1.5 feet) of the section. Bedrock is slightly to badly decomposed schist.

D. Gritzka and one helper worked at this location in 1981 using a D8H bulldozer, and a 977 tracked loader. They mined an irregularly shaped cut along the left limit of the creek. The cut averaged 4.5 metres (15 feet) in depth, and had an area of approximately 4,650 square metres (50,000 square feet). Work was done on the property by two other people at the end of the 1981 season. They used a D7 bulldozer, and a 950 loader to rework part of the tailings from Mr. Gritzka's work, and to mine a small section of previously unmined ground. Magnum Enterprises operated at this location in 1982. Two people using a Case 450 B loader reworked the tailings from Mr. Gritzka's 1981 work, and mined previously unworked ground along the right limit of the creek.

G. Ahnert (28)
Hunker Creek 115 O 15
1980, 1981, 1982 (Klondike)
63° 55'N, 138° 54'W

This property is located along a small, steep, left limit tributary of the Right Fork of Hunker Creek. Deposits present are 4.5 to 10 metres (15 to 33 feet) of organic-rich muck, overlying 1.8 to 4.6 metres (6 to 15 feet) of laminated, clay-rich muck, and 1 metre (3 feet) or less of gravel. The presence of old underground workings suggests that the gravel horizon may originally have been thicker, but that the gravel has been removed from drifts which have since collapsed. Exposure of the deposits is very poor.

Work at this site was begun in 1980, when two people did stripping, and dug a shaft 9 metres (30 feet) deep. Work continued in 1981, and 1982. Mining was done by

hand. A small wooden sluice box was used to process the gravel mined.

P. Erickson (29)
D. Gritzka 115 O 15
Hunker Creek (Klondike)
1978, 1979, 1980 63° 54'N, 138° 54'W

This property is situated along the Right Fork of Hunker Creek, approximately 1,500 meters (4,900 feet) upstream from its confluence with the Left Fork of Hunker Creek. Deposits are up to 12 metres (40 feet) thick, but only the lowermost .6 metres (2 feet) of gravel, and .6 metres (2 feet) of the underlying bedrock are sluiced. Bedrock is slightly to badly decomposed schist.

P. Erickson worked at this location in 1978 using a D4 bulldozer and a D7 bulldozer. D. Gritzka assisted him part-time. They mined a cut of approximately 1,535 square metres (16,500 square feet) which extended 30 metres (100 feet) across the full width of the valley, and 50 metres (165 feet) upstream. The 1978 cut was 3 metres (10 feet) deep, but it had been partially stripped in previous years. During 1979, Mr. Erickson and Mr. Gritzka worked separately. Mr. Erickson used the D4 bulldozer and D7 bulldozer to mine two cuts totalling approximately 930 square metres (10,000 square feet). Mr. Gritzka mined a cut of approximately 560 square metres (6,000 square feet). Mr. Erickson and Mr. Gritzka worked together again in 1980. They used a D8H bulldozer, and a 977 loader with 2.3 cubic metre (3 cubic yard) bucket to mine three cuts totalling approximately 2,400 square metres (25,800 square feet). They also did stripping in preparation for future mining. Water for sluicing was impounded in a reservoir.

Gold from the upper portion of Hunker Creek is reported to have a fineness of 798 to 859. Gold from this location appears to be of two distinct types. The first is pale, and has a greenish silver colour. Grains are tabular, but do not appear badly worn. The second type is bright, and has a pinkish colour. Grains are lumpy, and have imprints of euhedral quartz grains, and inclusions of milky quartz. They appear somewhat worn.

G. Hakonson (30)
C. Ashley 115 O 15
S. Widmeyer (Klondike)
Hunker Creek 63° 54'N, 138° 55'W
1978, 1979, 1981

This property is situated along the upper portion of the Right Fork of Hunker Creek. An incomplete section of 1.2 to 1.8 metres (4 to 6 feet) of brown sandy gravel is present. Overlying deposits have been stripped. Bedrock is schist.

G. Hakonson and one helper worked for two weeks with a tracked loader during 1978. They did additional work during 1979. C. Ashley, S. Widmeyer, and two partners worked at this property during 1981, using a D7 bulldozer, and a 950 loader. They stripped approximately 4,600 cubic metres (6,000 cubic yards) of material, and mined and sluiced an additional equal amount of gravel.

Gold recovered from this location is coated by mercury, presumably due to the use of mercury by earlier miners. Botryoidal cassiterite (wood tin) is more common than at other sites downstream along Hunker Creek.

P. Erickson (31)
Hunker Creek 115 O 15
1981, 1982 (Klondike)
63° 53'N, 138° 55'W

This property is situated at the headwaters of the Right Fork of Hunker Creek. The creek valley is narrow, and has a gradient of about 5.5%. Deposits consist of a layer of variable thickness of colluvium and black muck, overlying 2.4 to 3 metres (8 to 10 feet) of sandy gravel. Clasts in the gravel are mostly flat, angular pieces of schist. An open-cut has been previously mined down the center of the valley, and shafts have been sunk every 7.5 metres (25 feet) along the right limit of the cut.

P. Erickson and one helper worked along the left limit at this location in 1981 and 1982. They used a D4 bulldozer for preparatory work, a D6C bulldozer for mining, and a D7 bulldozer for stripping.

Gold recovered from this site is rough, and does not appear worn.

B. Oud (32)
Allgold Creek 115 O 15
1978, 1979 (Klondike)
63° 54'N, 138° 44'W

Deposits from this location, which is just above the confluence of Allgold and Lucky Creeks, are variable in thickness. The section consists of approximately 4.5 metres (15 feet) of silty muck overlying from 1 to 6 metres (3 to 20 feet) of gravel. The gravel thickens southward, and is thickest at the junction of the two creeks. Bedrock is biotite schist.

The area has been extensively worked by hand-miners. Old ice-filled shafts are as little as 6 metres (20 feet) apart.

During 1978, Mr. Oud mined with a D7 and a D8 bulldozer. He continued work with the same equipment in 1979. A drain some 670 metres (2,200 feet) long was constructed to carry water away from the cut. Some work was also done on the left limit bench of Allgold Creek.

J. Alton (33)
Allgold Creek 115 O 15
1982 (Klondike)
63° 55' N, 138° 40'W

J. Alton began mining just upstream from Mr. Kinakin's workings in 1982. He mined in the centre of the creek valley and on a low left limit bench.

Mining was done using a D8K bulldozer, and a Michigan loader with 1 cubic metre (1.25 cubic yard) bucket. A reservoir provided water for sluicing.

Gold from this creek is reported to have a fineness of 858.

Allgold Holdings Ltd. (34)
Allgold Creek 115 O 15
1978, 1979, 1980 (Klondike)
1981, 1982 63° 55'N, 138° 40'W

Deposits from the centre of the creek valley, and from a left limit bench have been mined at this locality. The section consists of 3 to 4.5 metres (10 to 15 feet) of interlayered brown-grey and black organic-rich muck overlying 1 to 2 metres (3 to 6 feet) of grey and brown laminated sand and 3 to 3.5 metres (10 to 12 feet) of gravel. The gravel rests on lineated and foliated biotite-quartz schist bedrock.

During 1978, M. Kinakin worked with a D7 and a D8 bulldozer. In addition to stripping, he put in three small cuts totalling 825 square metres (8,750 square feet) in area. He used the same equipment to mine several small cuts just upstream from his previous work from 1979 to 1982. Water used for sluicing was gravity-fed during 1978, 1979, and 1980. A 15 cm (6 inch) pump was used in 1981 and 1982 to supply water for sluicing. Mr. Kinakin worked with one employee.

Klondike Vault Mining (35)
Dominion Creek 115 O 15
1979, 1980 (Klondike)
1981, 1982 63° 52'N, 138° 55'W

This property is situated along the headwaters of Dominion Creek. The creek valley is narrow, and has steep slopes. Deposits are from 4.5 to 6 metres (15 to 20 feet) thick, and consist of 1.5 to 3 metres (5 to 10 feet) of banded colluvium with greenish, chlorite schist-rich layers, and black, organic-rich layers containing wood fragments, overlying 1.5 metres (5 feet) of colluvium with sand and gravel lenses, and 1.5 metres (5 feet) of sandy, matrix-supported gravel. Bedrock is blocky-weathering chlorite schist.

K. Adams and W. Hansen mining at this location in 1979 using two 977 tracked loaders, and a Bantam C450 backhoe with .6 cubic metre (.75 cubic yard) bucket. They mined a cut 7.5 metres (25 feet) wide, 36.5 metres (120 feet) long, and 2.4 metres (8 feet) deep. One dam was built to create a settling pond. Two people worked using the same equipment during 1980. They built two dams upstream from their workings to impound water for sluicing, and mined a cut 9 metres (30 feet) wide, 76 metres (250 feet) long, and up to 6 metres (20 feet) deep. Mr. Adams and one helper continued work in 1981 and 1982, using the same equipment as in previous years. They mined a cut approximately 9 metres (30 feet) wide, 45 metres (150 feet) long, and 6 metres (20 feet) deep each year. A single channel sluice box was used to process the gravel. Water for sluicing was recirculated.

Gold from upper Dominion Creek is reported to have a fineness of 805 to 832. Gold from this site is of two types. About 75% of it is tabular, and appears worn. It is bright. The remainder is angular, and does not appear worn. Abundant fresh, angular magnetite, coarse pyritohedrons of pyrite 1 cm (.5 inches) in diameter and larger, and minor amounts of galena are also recovered from the deposits at this location.

I. Hamilton (36)
Dominion Creek 115 O 15
1978, 1979, 1980 (Klondike)
1981, 1982 63° 51'N, 138° 54'W

This property is located along the headwaters of Dominion Creek at the mouth of Little Dominion Creek. It is just upstream of the upper limit of dredging on Dominion Creek. Deposits at this site are up to 9.8 metres (32 feet) thick, and consist of up to 8 metres (26 feet) of black muck overlying 1.8 metres (6 feet) of brown silty gravel with rounded clasts less than 20 cm (8 inches) in diameter. Colluvium up to 9 metres (30 feet) thick consisting mainly of slabs of bedrock overlies the muck and gravel deposits along part of the creek. Bedrock is quartz-feldspar porphyry. An old shaft 2.4 metres (8 feet) square with three rooms opening off of it was found at the mouth of Little Dominion Creek.

I. Hamilton worked on Little Dominion Creek at its mouth in 1978, using a D6 bulldozer and Bantam C450 backhoe. He stripped 7.6 metres (25 feet) of black muck, and mined and sluiced 1.8 metres (6 feet) of gravel from a cut of 700 square metres (7,500 square feet). Water for sluicing was impounded in a reservoir on Dominion Creek. Mr. Hamilton and a partner used a D8 bulldozer in 1979 to mine a cut of 2,800 square metres (30,000 square feet) along Dominion Creek. In 1980, Mr. Hamilton and his partner mined using the D8 bulldozer for part of the season, and Mr. Hamilton worked alone using a D6 bulldozer and Bantam C475 backhoe with 1.1 cubic metre (1.5 cubic yard) bucket for the remainder of the season. Problems were encountered with thick layers of colluvium and black muck. Three people worked along the right limit of the creek during 1981, using a D6 bulldozer, a D7 bulldozer, and a backhoe. They mined approximately 11,500 cubic metres (15,000 cubic yards) of material. Four people continued work using the same equipment in 1982. They mined approximately 30,500 cubic metres (40,000 cubic yards) of material.

In addition to gold, magnetite, pyrite, and limited amounts of galena are recovered from the deposits at this site.

Gem Resources (37)
Dominion Creek (Klondike)
1979 63° 51'N, 138° 50'W

This property is situated along the upper portion of Dominion Creek, just upstream from the mouth of Mummie Pup.

A limited amount of work was done at this location during 1979, by four people working with a D2 and a D4 bulldozer.

Gem Resources **(38)**
Territorial Gold Placers Ltd. **115 O 15**
Dominion Creek **(Klondike)**
1978, 1979 **63° 51'N, 138° 49'W**
1980, 1981

This property is situated along Dominion Creek at the mouth of 21 Below Pup. Deposits in the center of the valley consist of tailings from dredging operations prior to 1934. Thick layers of back muck cover limited gravel deposits along both sides of the creek, parts of which have previously been mined underground.

Work was done on this property in 1978 by Gem Resources. Four people mined approximately 3,800 cubic metres (5,000 cubic yards) of material, using a D2 and a D4 bulldozer. The gold recovered was thought to have come from pillars left in the old underground workings. Territorial Gold Placers Ltd. took over the property in 1979, and stripped black muck from previously unmined ground along the right limit. Four people continued work in 1980, using two D8 bulldozers. They stripped black muck from along the right limit, and stripped part of the dredge tailings in the valley centre. They also prepared a bedrock drain. Sluicing was begun in August, using a modified "Ross" sluice box capable of processing 125 cubic metres (160 cubic yards) of material per hour. Six people continued work in 1981, using two D8 bulldozers. Territorial Gold Placers Ltd. went into receivership prior to the 1982 mining season. There was no mining activity at this location during 1982.

Airgold Ltd. **(39)**
J. Brown **115 O 15**
Dominion Creek **(Klondike)**
1981 **63° 51'N, 138° 49'W**

This property is situated on a low level left limit bench of Dominion Creek, just upstream from its confluence with Caribou Creek, at the site of the former town of Caribou. The site was riddled by underground workings. Deposits in the cut, which lies 6 to 9 metres (20 to 30 feet) above the present creek level consist of 2.5 to 3 metres (8 to 10 feet) of "black muck" with interbedded sandy and silty horizons overlying .5 to 1.2 metres (2 to 4 feet) of clast supported gravel with sandy matrix. Clasts in the gravel are of schist and quartz. Abundant rounded magnetite grains are present in the matrix of the gravel. Bedrock is mica schist to gneiss. The bedrock surface is irregular. Parts of the bedrock, and clasts in some parts of the gravel are decomposed.

Three people worked at this site with a D8 bulldozer and a 988 loader in 1981. They mined a cut 60 metres (200 feet) wide, 230 metres (750 feet) long, and 6 metres (20 feet) deep. One metre (3 feet) of bedrock was mined and processed along with the gravel.

Airgold Ltd. **(40)**
J. Brown **115 O 15**
W. Israel **(Klondike)**
Caribou Creek **63° 50'N, 138° 49'W**
1978, 1979, 1980
1981, 1982

This property is situated along the lower reaches of Caribou Creek, near its confluence with Dominion Creek. Deposits at the site consist of 3 to 9 metres (10 to 30 feet) of "black muck" overlying 1 to 2.5 metres (3 to 8 feet) of matrix supported gravel. Those at the centre of the creek valley are not frozen. Bedrock is blocky-weathering quartz-muscovite-chlorite schist.

J. Brown and W. Israel took over this property from G. Burgelman in 1978. They worked with a D9 bulldozer, 966 loader, and drag-line with 1.1 cubic metre (1.5 cubic yard) bucket, and moved approximately 76,000 cubic metres (100,000 cubic yards) of material. Some of the material was stripped, and some came from the preparation of a drain 60 metres (200 feet) long, and up to 9 metres (30 feet) deep. Only 4,600 cubic metres (6,000 cubic yards) of material were sluiced. A D8 bulldozer was used to strip an additional 115,000 cubic metres (150,000 cubic yards) of material in 1979. Five thousand cubic metres (6,500 cubic yards) of material were sluiced. In 1980, five people worked with a D7F and a D8H bulldozer, and a 966 loader. They mined a cut 60 metres (200 feet) long, 45 metres (150 feet) wide and 8 metres (26 feet) deep. All 2 metres (6 feet) of gravel, and up to 1.2 metres (4 feet) of bedrock were sluiced. The gold was apparently distributed erratically through the section. Three people worked with a D8 bulldozer and a 966 loader during 1981. They mined a cut 15 metres (50 feet) wide, 60 metres (200 feet) long, and up to 12 metres (40 feet) deep from along the right limit of the creek. Deposits of "black muck" were up to 9 metres (30 feet) thick in the cut. During 1982, three people using a D8H bulldozer, and two 966 loaders worked in four 6 metre (20 feet) deep cuts totalling 60 metres (200 feet) wide, and 300 metres (1,000 feet) long. Water for sluicing was diverted from Dominion Creek into a holding pond in tailings from 1981 work, and pumped from there to the single-channel metal sluice box.

Allgold Placers **(41)**
J. Stuart **115 O 15**
Caribou Creek **(Klondike)**
1978, 1979, 1980 **63° 49'N, 138° 50'W**
1981, 1982

This property is situated on the upper reaches of Caribou Creek, a left limit tributary of Dominion Creek. Deposits consist of 1 to 4.5 metres (3 to 15 feet) of black muck overlying 1.5 to 2.5 metres (5 to 8 feet) of clast-supported sandy gravel containing abundant grains of magnetite. Bedrock is quartz-sericite schist, and is decomposed in part. The deposits are not frozen. They have not previously been mined. Deposits on a low level left limit bench along Caribou Creek have previously been partly mined by underground methods. Work was confined to those portions of the deposits which are frozen. The section on the bench is similar to the one in the creek except that colluvium of variable thickness blankets it.

Work on the property during 1978 was done by two people using a D8-46A and an International TD-15B bulldozer. They stripped 1.5 metres (5 feet) of "black muck" from a strip 30 metres (100 feet) wide and 150 metres (500 feet) long on the bench along the left limit of Caribou Creek above its confluence with Lion Gulch. They also mined and processed 1.5 metres (5 feet) of gravel and bedrock from three cuts totalling 1,650 square metres (18,000 square feet) in area. They continued work in the same area in

1979. In 1980, they moved approximately 1,000 metres (3,500 feet) downstream, and began work with a D8-46A and an International TD-15 bulldozer, and a backhoe. A drainage ditch 350 metres (1,100 feet) long was dug, and a valley-bottom cut approximately 9,150 square metres (30,000 square feet) in area was stripped and mined to a depth of 4.5 metres (15 feet). Three people worked with two D8H bulldozers and a Hein-Warner C14A backhoe with .75 cubic metre (1 cubic yard) bucket in 1981 and 1982. They stripped and mined a cut approximately 90 metres (300 feet) square and 6 to 7.5 metres (20 to 25 feet deep) each year. Water for sluicing was obtained from a reservoir on Caribou Creek above Lion Gulch. Some water for sluicing was recirculated from a settling pond, as the flow in Caribou Creek was insufficient.

Ballarat Mines Ltd. **(42)**
Ballarat-Tatlow Joint Venture **115 O 15**
Dominion Creek **(Klondike)**
1978, 1979, 1980 **63° 51'N, 138° 48'W**
1981, 1982

This property is situated along Dominion Creek, between the mouths of Caribou Creek and Almeda Pup. Deposits present include dredge tailings, and a section of 4.5 to 6 metres (15 to 20 feet) of black muck overlying 2.4 metres (8 feet) of gravel on a low night limit bench. The gravel is sandy and clast-supported, with clasts up to 30 cm (12 inches) in diameter. The clasts are of quartz, schist, and quartz-feldspar porphyry.

Stripping, and other work in preparation for future mining was done by Ballarat Mines Ltd. in 1978. Additional stripping was done in 1979, and a bedrock drain and creek by-pass were prepared. Ballarat-Tatlow Joint Venture began mining on the property in 1980, when six people worked using two D8H bulldozers, and one D9 bulldozer. They mined a cut 52 metres (170 feet) wide, and 245 metres (800 feet) long. Work in 1981 was done just downstream from the mouth of Caribou Creek, approximatley 750 metres (2,500 feet) upstream from the site of operations in 1980. Six people worked on two shifts using one D9 bulldozer and two D8 bulldozers. They stripped and mined two cuts approximately 100 metres (300 feet) wide, and totalling 245 metres (800 feet) in length. Work continued at this location in 1982. Four people working on two shifts used one D8 bulldozer and one D9 bulldozer to strip and mine an area 60 metres (200 feet) wide, and 550 metres (1,800 feet) long. Both the old dredge tailings, and the deposits along the low bench were worked. The single channel sluice box used in 1980 and 1981 was replaced by a three channel sluice box in 1982, in an attempt to increase fine gold recovery. Water for sluicing was recirculated from the settling pond.

J.P. Taylor **(43)**
Dominion Creek **115 O 15**
1979, 1980 **(Klondike)**
1981, 1982 **63° 49'N, 138° 40'W**

This property is situated along the left limit of the middle portion of Dominion Creek, approximately 600 metres (1,950 feet) downstream from the mouth of Portland Creek. Deposits on a low bench consist of 1.5 to 4.5 metres (5 to 15 feet) of muck and silty muck overlying 1.5 metres (5 feet) of clast-supported sandy gravel. Bedrock is badly decomposed chlorite schist. At one place on this property, it appears that thrust faulting with a displacement of a metre (3 feet) or more of both bedrock and gravel has occurred.

J.P. Taylor began preparatory work at this location in 1974, but did not begin mining until 1979. In 1979, he used a Bobcat 720 loader to mine approximately 285 cubic metres (375 cubic yards) of material. He used a D8-14A bulldozer and the loader in 1980 to mine approximately 1,150 cubic metres (1,500 cubic yards) of material. He continued work in 1981 and 1982, when he used a D8L bulldozer and John Deere 450 loader to mine three small cuts totalling 4,600 cubic metres (6,000 cubic yards). Water for sluicing was obtained from a spring, and was recirculated.

Gold from this property is reported to have a fineness of 806.

G. Bedard **(44)**
Dominion Creek **115 O 15**
1978, 1979, 1980 **(Klondike)**
63° 49'N, 138° 39'W

This property is situated along Dominion Creek, just downstream from the mouth of 72 Pup. Deposits consist of tailings from old dredging operations.

G. Bedard worked at this location in 1978 using a D7 bulldozer, and a sluice box 90 cm (36 inches) wide, and 9 metres (30 feet) long. He continued work with one helper in 1979 and 1980. A 955 loader was used to mine the old tailings, and to feed a dump box. A manually operated monitor was used to wash the material out of the dump box, and over a vibrating screening unit. All material coarser than 2.5 cm (1 inch) was rejected. Grains between .6 and 2.5 cm (.25 and 1 inch) in diameter were washed through one sluice box, while grains less than .6 cm (.25 inches) in diameter were washed separately. The cuts mined in 1979 and 1980 were approximately 2,900 square metres (31,250 square feet) each.

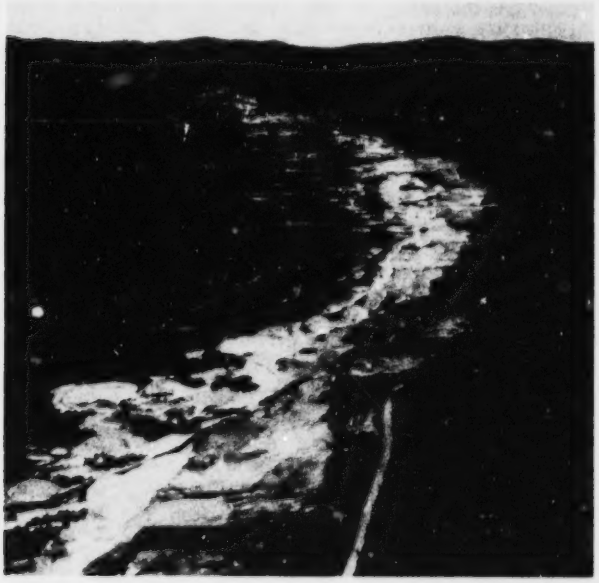
In addition to gold, magnetite, ilmenite, pyrite, epidote, and garnet were recovered from the deposits at this location.

Ace Placer Mines **(45)**
Dominion Creek **115 O 15**
1978, 1979 **(Klondike)**
1981, 1982 **63° 48'N, 138° 36'W**

This property is situated along the left limit of Dominion creek, just downstream from Nevada Creek. Deposits being mined lie on the gentle slope along the left limit of the creek, and as much as 300 metres (1,000 feet) from it. The gravel thins and the overburden covering it thickens as the distance from Dominion Creek increases. In one cut, the deposits are 7.3 to 8.8 metres (24 to 29 feet) thick, and consist of 3 to 4.5 metres (10 to 15 feet) of silty colluvium overlying 2.4 metres (8 feet) organic-rich silt and black muck, and 1.8 metres (6 feet) of sandy gravel. Clasts in the gravel are up to 20 cm (8 inches) in diameter, but most commonly are about 10 cm (4 inches in diameter. Abundant fine grained magnetite is present in the gravel.

Bedrock is badly decomposed sericitic schist.

A. and N. Sailer began work at this location in 1973. In 1978, they worked using two D8-14A bulldozers, and mined a cut of 4,925 square metres (53,000 square feet). They continued work using the same equipment in 1979 and mined a cut of 3,725 square metres (40,000 square feet). In 1980, six people worked using one D6 bulldozer, two D8-14A bulldozers, and a 980B loader. They mined a cut of 1,850 square metres (20,000 square feet). Three people worked in 1981, using the same equipment as in 1980, and mined a cut of 3,725 square metres (40,000 square feet). A three channel sluice box, with side runs for material less than 1 cm (.4 inches) in diameter, and a center run for coarser material replaced the single channel sluice box used previously. The new sluice box was fed by loader, and the gravel was washed into the box by the box tender who operated a monitor. Work continued in 1982, when four people mined with the same equipment as in 1981, plus a D9 bulldozer. One cut of 3,725 square metres (40,000 square feet) was mined.



View upstream along Dominion Creek. Tailings from early dredge mining operations in the centre of the valley are partly overgrown, and partly covered by tailings from more recent bulldozer mining operations along the left limit of the creek. Recent workings of Ace Placers are along the margin of the mined area in the foreground, and middle distance of the photograph.

Ace Placer Mines **(46)**
Dominion Creek **115 O 15**
1978, 1979, 1980 **(Klondike)**
1981, 1982 **63° 47'N, 138° 35'W**

The property is situated along the left limit of Dominion Creek, approximately 1,975 metres (6,500 feet) downstream from the mouth of Nevada Creek. Deposits being mined lie on the gentle slope along the left limit of the creek. The gravel thins, and the overburden covering it thickens as the distance from Dominion Creek increases. Bedrock is badly decomposed to a depth of at least 1.2 metres (4 feet)

A. and N. Sailor worked at this location in 1978 using two D8-14A bulldozers. They mined one cut of 2,975 square metres (32,000 square feet). They continued work with the same equipment in 1979, and mined a cut of 3,725 square metres (40,000 square feet). Six people mined in 1980, using one D6 bulldozer, two D8-14A bulldozers, and a 980B loader. They mined two cuts totalling 7,450 square metres (80,000 square feet). Overburden from 3 to 3.6 metres (10 to 12 feet) thick was stripped, and .6 metres (2 feet) of gravel were mined and sluiced in one cut, while 1.8 metres (6 feet) of gravel were mined and sluiced in the other. Work continued in 1981, when three people mined using the same equipment as in 1980. One cut of approximately 3,725 square metres (40,000 square feet) was mined. Four people mined in 1982 using the same equipment as in 1981 plus a D9 bulldozer. One cut of approximately 3,725 square metres (40,000 square feet) was mined on the left limit slope, and a second, smaller cut was mined at the edge of the dredge tailings, at creek level.

G. Gatenby **(47)**
L. Gatenby **115 O 15**
Dominion Creek **(Klondike)**
1978, 1979, 1980 **63° 47'N, 138° 34'W**
1981, 1982

This property is situated along the left limit slope of Dominion Creek, upstream from the mouth of Hunter Creek. Deposits consist of 3 to 4.5 metres (10 to 15 feet) of colluvium, silt, and organic-rich silt overlying 1.8 metres (6 feet) of clast- to matrix-supported gravel. The gravel contains large scale cross-bedding and channel features, and grades upward into the overlying silt and organic-rich silt. The thickness of the gravel unit decreases with increasing distance from Dominion Creek.

Work at this location was begun by hand by G. and L. Gatenby in 1975. In 1978, they worked using a John Deere 350 loader. They stripped approximately 7,650 cubic metres (10,000 cubic yards) of material, and mined and sluiced an additional 1,550 cubic metres (2,000 cubic yards) of gravel. They continued work in 1979, using an Allis-Chalmers 16 bulldozer and the loader to mine a cut of 700 square metres (7,500 square feet). The same equipment was used in 1980 to strip a cut of 2,800 square metres (30,000 square feet), and to mine and sluice a cut of 1,400 square metres (15,000 square feet). A cut of approximately 1,400 square metres (15,000 square feet) was mined in 1981. In 1982, they moved approximately 380 metres (1,250 feet) downstream, and mined along the left limit slope opposite the mouth of Hunter Creek. They used a D8 bulldozer to mine a cut 38 metres (125 feet) wide, and 150 metres (500 feet) long. The colluvium and silt were stripped, and the gravel was sluiced in a single channel sluice box. The upper .6 metres (2 feet) of bedrock was also sluiced.

J. Jellett (48)
C. Simpson 115 O 15
Dominion Creek (Klondike)
1982 63° 46'N, 138° 33'W

This property is located along the left limit slope of Dominion Creek, just upstream from the mouth of Jensen Creek. Deposits present include tailings from former bulldozer mining operations, and a section 5.5 metres (18 feet) thick consisting of 1.5 metres (5 feet) of colluvium overlying 1.5 metres (5 feet) of gravel, 1 metre (3 feet) of silt and organic silt, and 1.5 metres (5 feet) gravel. The gravel is clast-supported, and pebbly, and has cross-bedding, and ice wedges. Bedrock is chlorite schist.

J. Jellett and C. Simpson worked during 1982, using one D6 bulldozer, one D7 bulldozer, and a 980B loader. They worked along the margin of Dominion Placers' 1981 workings, and mined and sluiced tailings left by Dominion Placers. They also mined a cut approximately 23 metres (75 feet) wide, and 60 metres (200 feet) long in deposits along the slope which had been partly stripped in previous years. They used a three channel sluice box to process the gravel mined. Grains less than .6 cm (.25 inches) in diameter were sluiced in the side runs, while coarser grains were sluiced in the centre run. Traction belting was used under the riffles and expanded metal in the sluice box in place of cocoa matting or astro turf. It was found to be effective, easy to clean, and relatively inexpensive.

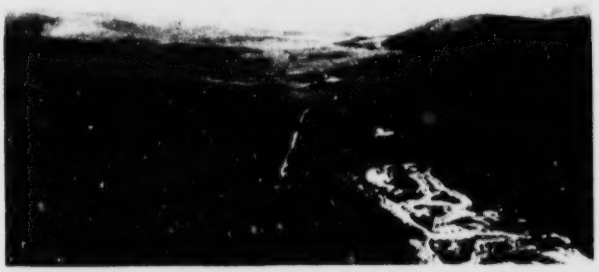
Gold recovered from this location was fine-grained, and appeared worn. Some grains had quartz adhering to the gold. In addition to gold, abundant magnetite and garnet, and some rutile up to 1 cm (.4 inches) in diameter were recovered.

Dominion Placers (49)
Forum Resources 115 O 15
3734 Yukon Ltd. (Klondike)
Kajo Placers 63° 46'N, 138° 33'W
Dominion Creek
1980, 1981, 1982

This property is located along the left limit slope of Dominion Creek, just upstream from the mouth of Jensen Creek. Deposits consist of up to 9.8 metres (32 feet) of colluvium, silt, and organic-rich silt overlying 1.8 to 3 metres (6 to 10 feet) of gravel.

Work on claims optioned from Forum Resources was begun by Dominion Placers in 1980. Work was done by twenty-five employees on two shifts, using one D8H bulldozer, one D8K bulldozer, one D9K bulldozer, one 980C loader, and one 992 loader. Stripping and other preparatory work were done. An air strip was built on old dredge tailings. Tailings from former bulldozer mining operations, and gravel from deposits along the slope were mined and sluiced through a "Ross" sluice box capable of processing 200 cubic metres (400 cubic yards) of material per hour. Approximately 61,150 cubic metres (80,000 cubic yards) of material were sluiced in 1980. One worker was killed when the loader he was operating rolled over. Work continued in 1981, when 37 employees mined using one D6 bulldozer, one D8 bulldozer, one D9 bulldozer, four 980C loaders with 4.2 cubic metre (5.5 cubic yard) buckets, one 992 loader with 9.2 cubic metre (12 cubic yard) bucket, and a 225 backhoe. Three "Ross" sluice boxes were set up, and two were in use at most times. Sluicing water was directed to three settling ponds, and then through old dredge tailings. Three people worked on the property for 3734 Yukon Ltd. and Kajo Placers in 1982. They used a D9H bulldozer and 992A loader, along with a "Ross" sluice box to mine along the left limit slope of Dominion Creek.

In addition to gold, abundant magnetite, and limited amounts of scheelite and coarse-grained rutile were recovered from the deposits at this location.



View downstream along Dominion Creek from the Dominion Placers property. Tailings from dredging by Yukon Consolidated Gold Corporation Dredge 10 are visible in the right foreground.

D. Rintoul (50)
S. Mynot 115 O 15
Gold Run Creek (Klondike)
1978, 1982 63° 45'N, 138° 44'W

This property is situated along the upper portion of Gold Run Creek, upstream from the end of the dredged area. The Gold Run Creek valley is narrow, and deposits thicken rapidly away from the center of the valley. Deposits in the center of the valley consist of 4.6 to 5.2 metres (15 to 17 feet) of black muck overlying 1.2 metres (4 feet) of yellow quartz-rich gravel. Deposits 15 metres (50 feet) from the centre of the valley along the left limit consist of 10.7 to 12 metres (35 to 40 feet) of black muck overlying 3.6 metres (12 feet) of gravel and broken bedrock. Bedrock is chlorite schist.

Two employees worked for D. Rintoul at this property in 1978. They mined a cut 15 metres (50 feet) wide, and 60 metres (200 feet) long along the left limit of the creek. S. Mynott worked at this location in 1982, using two D9 bulldozers, and a "Ross" sluice box. He mined a cut along the right limit of the creek.

Consolidated Mines Yukon Ltd. **(51)**
Ross Mining Services Ltd. **115 O 10**
Gold Run Investments Corp. **(Klondike)**
Dominion Creek **63° 41'N, 138° 36'W**
1978, 1979
1980, 1981

This property is situated along the right limit of Dominion Creek, in the broad, flat valley just downstream from the mouth of Gold Run Creek. Deposits are 10.6 to 13.7 metres (35 to 45 feet) thick, and consist of 3 to 4.6 metres (10 to 15 feet) of black muck overlying 7.6 to 9.1 metres of gravel. The gravel has an upper, brown sandy polymictic portion, overlying a white, quartz-rich portion analogous to the White Channel gravel of Hunker and Bonanza Creeks. Parts of the quartz-rich gravel are badly stained by iron from groundwater. Underground mining in large, timbered rooms was done previously on the property.

View of cut in the broad Dominion Creek valley mined by Gold Run Investments Corp. in 1981. The scraper-loader is mining gravel and transporting it to the sluice box at the far end of the cut.

The large sluice box used by Gold Run Investments Corp. in 1981 is at the centre of this photograph. Scraper-loaders mining in the cut are in the background, while a loader and a scraper-loader stacking tailings are in the foreground.

Work at this location began in 1974. In 1978, Consolidated Mines Yukon Ltd. used a D8 bulldozer, and water to do stripping. Stripping, and some sluicing were also done in 1979. Operations expanded in 1980, when Ross Mining Services Ltd. managed work done by Gold Run Investments Corp. The property was held by Consolidated Mines Yukon Ltd. Fourteen people worked using one D8H bulldozer, two D9H bulldozers, one 922B loader, one 245 backhoe, two 637 scraper-loaders with 23.7 cubic metre (31 cubic yard) capacity, and one 14D grader. A drain 3,650 metres (12,000 feet) long, and up to 12.2 metres (40 feet) deep was dug. There were 229,350 cubic metres (300,000 cubic yards) of material stripped, and an additional 344,000 cubic metres (450,000 cubic yards) of material mined and sluiced. The material sluiced was processed in a modified "Ross-500" sluice box with a capacity of up to 535 cubic metres (700 cubic yards) of material per hour. Work at the site continued in 1981. Scraper-loaders mined gravel from the large pit, and moved it to a stockpile near the sluice box. The sluice box was fed by D9 bulldozer when gravel from the top of the section was being processed, but was fed more slowly by backhoe when gravel from the bottom of the section was being processed. Tailings were stacked by loader, and by scraper-loader. A new sluice box, the "Ross-1000" was built for use at the property in 1981. It has a capacity of 765 cubic metres (1,000 cubic yards) of material per hour. Including the dump box, it is 18.3 metres (60 feet) long, and 9.1 metres (30 feet) wide, and weighs 90,750 kg (200,000 lb). When operating, it requires 75,700 litres (16,650 gallons) of water per minute. This sluice box is reported to be the world's largest. Sluicing at this property was done one one shift during 1981, at a rate of approximately 7,650 cubic metres (10,000 cubic yards) or 13,600 tonnes (15,000 tons) per day, making this mining operation the largest in Yukon. Gold Run Investments Corp. went into receivership prior to the 1982 mining season. There was no activity at this property in 1982.

Gold from this part of Dominion Creek is reported to have a fineness of 816 to 840. In addition to gold, magnetite, garnet, and epidote were recovered from the deposits at this location.

J. Erickson **(52)**
H. Liedtke **115 O 10**
Dominion Creek **(Klondike)**
1982 **63° 38'N, 138° 41'W**

This property is situated along the lower part of Dominion Creek, approximately 2,260 metres (7,500 feet) downstream from the mouth of Sulphur Creek, and just downstream from the limit of dredging by Yukon Consolidated Gold Corporation Dredge 6. Deposits are 4.5 to 5.5 metres (15 to 18 feet) thick, and consist of .6 to 1.2 metres (2 to 4 feet) of soil and organic-rich muck overlying 1.2 to 1.5 metres (4 to 5 feet) of cross-bedded matrix-

View of the area along Dominion Creek mined by J. Erickson and H. Leidtke during 1982. It is just downstream from tailings left by Yukon Consolidated Gold Corporation Dredge 6.

supported sandy gravel, 2.4 metres (8 feet) of massive silty brown matrix-supported gravel with the few clasts present oriented on end, and a layer of coarse boulders up to 90 cm (3 feet) in diameter. Bedrock is gneissic granodiorite.

Work at this property was done by J. Erickson and H. Liedtke during 1982. They used a D8H bulldozer, and one 966 loader to mine two cuts totalling 4,650 square metres (50,000 square feet). The deposits were thawed, and problems were encounted with groundwater flooding the cut.

Gold recovered from this location is reported to have a fineness of 841. It is fine-grained, and appears worn. Some grains of gold have quartz adhering to them. In addition to gold, magnetite, garnet, and a small amount of pyrite and rutile are recovered from the deposits at this site.

Territorial Gold Placers Ltd. **(53)**
Kelsey Exploration Ltd. **115 O 10**
Eureka Creek **(Klondike)**
1978, 1979, 1980 **63° 37'N, 138° 50'W**
1981, 1982

This property is situated along the left limit of Eureka Creek, approximately 450 metres (1,500 feet) upstream from its confluence with Indian River. Deposits in the broad valley are 5.2 to 7.6 metres (17 to 25 feet) thick, and consist of 1.5 to 3 metres (5 to 10 feet) of black muck overlying 3.7 to 4.6 metres (12 to 15 feet) of gravel. Bedrock is blocky weathering to badly decomposed schist.

Work on the property in 1978 was done by Territorial Gold Placers Ltd. One D8 bulldozer was used. The company continued work in 1979, when two D8 bulldozers were used. There were 15,750 gm (506 ounces) of gold recovered from the 23,550 cubic metres (30,800 cubic yards) of material mined. Kelsey Explorations Ltd. took over the property in 1980. At the beginning of the season, eight people worked at the site, but the crew was enlarged to 12 people part way through the season. Work was done on two shifts, with two D8H bulldozers, one D8K bulldozer, and one 627B scraper-loader. Tailings from 1974 mining operations, and previously unworked material were mined from two cuts totalling 9,300 square metres (100,000 square feet). The material mined was processed through a "Ross" sluice box at a rate of 1,530 cubic metres (2,000 cubic yards) per day. Water for sluicing was recirculated from a settling pond. Work continued in 1981 when up to 40 employees mined on two shifts using two D8 bulldozers, one D9 bulldozer, one 627B scraper-loader, and three 637 scraper-loaders. The black muck and some gravel were stripped. The rest of the gravel was mined from two large cuts with the scraper-loaders, and transported to grizzly, through which it was dumped into a hopper. A conveyor belt transported gravel from the hopper to the sluice box at a steady rate. The "Ross" sluice box used in 1981 was larger than the one used in 1980, and processed aproximately 305 cubic metres (400 cubic yards) of material per hour. Thirty-five employees worked at the property in 1982, using the same equipment as in 1981 plus one additional D8 bulldozer, and one additional Fiat-Allis 31 bulldozer. Drill results from 1952 test work were used to plan work at this location.

Hakkon Placers **(54)**
Eureka Creek **115 O 10**
1978, 1979, 1980 **(Klondike)**
1981, 1982 **63° 34'N, 138° 54'W**

This property is situated along the central portion of the Right Fork of Eureka Creek. Deposits present are 6 to 7.3 metres (20 to 24 feet) thick, and consist of 1.2 to 2.4 metres (4 to 8 feet) of black muck overlying 4.9 metres (16 feet) of brown sandy gravel. Bedrock is blocky weathering schist. Numerous old shafts from underground workings occur along this part of Eureka Creek.

Work at this location was begun by Hakkon Placers in 1978. One D8 bulldozer was used to mine. Water for sluicing was gravity-fed. Work in 1979 was done using two D8H bulldozers. The black muck and all but the lowermost 1.5 to 2.4 mestres (5 to 8 feet) of gravel were stripped. The remaining gravel and .6 metres (2 feet) of bedrock were mined and sluiced. Five people worked using two D8H bulldozers and a D9G bulldozer in 1980. Approximately 20,650 cubic metres (27,000 cubic yards) of material were stripped, and 17,575 cubic metres (23,000 cubic yards) of gravel were mined and sluiced from two cuts. Water for sluicing was recirculated from a settling pond. Work continued in 1981 and 1982, using the same equipment and methods as in 1980.

Gold from Eureka Creek is reported to have a fineness of 677 to 745.

Consolidated Mines Yukon Ltd. **(55)**
Eureka Creek **115 O 10**
1978, 1979, 1980 **(Klondike)**
1981, 1982 **63° 34'N, 138° 51'W**

This property is situated along the middle portion of the Left Fork of Eureka Creek. Deposits consist of black muck overlying brown gravel. Bedrock is chist.

Consolidated Mines Yukon Ltd. worked at this location each season from 1978 to 1982. Black muck and

some gravel were stripped, and the remaining gravel was mined and processed through a "Ross" three channel sluice box.

D.Groner (56)
Sulphur Creek 115 O 10
1980 (Klondike)
63° 41'N, 138° 46'W

This property is situated along the gentle right limit slope of Sulphur Creek, approximately 6.4 km (4 miles) upstream from its confluence with Dominion Creek.

Work was done in previously unmined deposits along the margin of old dredge tailings in 1980. A small bulldozer, and a small backhoe-loader were used to mine a cut 15 metres (50 feet) wide and 30 metres (100 feet) long. From .6 to 3 metres (2 to 10 feet) of colluvium and fine gravel were removed from the cut. Bedrock was not reached. A sluice box 60 cm (24 inches) wide, and 4.9 metres (16 feet) long was used to process the material mined. Water for sluicing was pumped from a pond in the dredge tailings adjacent to the cut.

J. Wierda (57)
G. Kerr 115 O 10
P. Favron (Klondike)
Sulphur Creek 63° 41'N, 138° 46'W
1981, 1982

This property is located along the gentle right limit slope of Sulphur Creek, approximately 7 km (4.4 miles) upstream from its confluence with Dominion Creek. Deposits are 4.3 to 4.9 metres (14 to 16 feet) thick, and consist of 3.7 metres (12 feet) of black muck with coarse pieces of wood including stumps, overlying .6 to 1.2 metres (2 to 4 feet) of clast-supported gravel with rounded clasts. Bedrock is decomposed chlorite schist.

J. Wierda and G. Kerr worked at this property in 1981. They used a D6 bulldozer to do stripping, and a small amount of mining. P. Favron began work at the property late in 1981, using a Terex 8230 bulldozer to do stripping. He continued work with the same equipment in 1982, and stripped and mined a cut of approximately 4,875 square metres (52,500 square feet). He processed the gravel through a three channel sluice box, and found that the gold recovery rate in the centre channel increased significantly when he installed punch plate over the riffles along its full length.

H. Krueger (58)
Sulphur Creek 115 O 10
1978, 1979, 1980 (Klondike)
1981, 1982 63° 42'N, 138° 48'W

This property is situated along the right limit of Sulphur Creek, approximately 8.6 km (5.4 miles) upstream from its confluence with Dominion Creek. Deposits are 9.1 to 9.8 metres (30 to 32 feet) thick, and consist of 3 to 4.9 metres (10 to 16 feet) of black muck with abundant tree remains, overlying 1.2 to 3 metres (4 to 10 feet) of sand with some bouldery sections, 1.2 metres (4 feet) of barren brown gravel, and 2.4 metres (8 feet) of gold-bearing quartz-rich gravel analagous to the White Channel gravel of Hunker and Bonanza Creeks. The deposits lie adjacent to tailings from former dredging operations.

H. Krueger worked at this property in 1978 using a D7E bulldozer, a 955K tracked loader, and a dragline with 1.3 cubic metre (1.75 cubic yard) capacity. He stripped and mined a cut of 350 square metres (3,750 square feet). He continued work using the same equipment in 1979, and stripped and mined a cut of 450 square metres (4,850 square feet). In 1980, he used the same equipment to enlarge the cut by 2,450 square metres (26,400 square feet). He used a single channel sluice box in 1978 and 1979, but modified it by adding undercurrents to each side in 1980. Mr. Krueger continued to use the same equipment to mine at this location in 1981 and 1982.

Granville Joint Venture (59)
Teck Crop. 115 O 10
Sulphur Creek (Klondike)
1978, 1979, 1980 63° 43'N, 138° 49'W
1981, 1982

This property is situated along the middle portion of Sulphur Creek, just upstream from the limit of dredging done by Yukon Consolidated Gold Corporation Dredge 8, which stopped work in 1963. Deposits are from 9.1 to 15.2 metres (30 to 50 feet) thick, and consist of 5.5 to 10.7 metres (18 to 35 feet) of black muck overlying 0 to 3.7 metres (0 to 12 feet) of clast-supported gravel with most clasts of chlorite schist, and .9 to 3.7 metres (3 to 12 feet) of quartz-rich cross-bedded sand and gravel analagous to the White Channel gravel of Hunker and Bonanza Creeks. The gravel with the chlorite schist clasts occurs as a wedge at the mouth of the left limit tributary downstream from Brimstone Gulch. Bedrock is blocky weathering to badly decomposed quartz-sericite schist. Although the area has

Stripping at the Granville Joint Venture property on Sulphur Creek in 1982. The area in the photograph (and beyond) has been stripped of black muck by hydraulicking. The bulldozers and loaders are completing the stripping by removing tree fragments and boulders from within the black muck which were not washed away by the water.

not been dredged some old underground workings are present.

Work on the property, which is held by Granville Joint Venture, began in 1978. A dam was constructed to form a water reservoir, and a diversion ditch 1,525 metres (5,000 feet) long was dug. A bulldozer and backhoe with 1.1 cubic metre (1.5 cubic yard) bucket were used in 1979 to dig a bedrock drain 915 metres (3,000 feet) long, 15 metres (50 feet) wide, and up to 7.6 metres (25 feet) deep. Teck Corp. were operators on the property in 1980, when seventeen people worked on two shifts, using one D8H bulldozer, one D8K bulldozer, one 966C loader, and three 627B scraper loaders. They mined a cut approximately 150 metres (500 feet) wide and 425 metres (1,400 feet) long extending upstream from the limit of the dredge tailings. The area had previously been partially stripped. Mining was done by the scraper-loaders, which also moved the gravel to the sluice box. The sluice box was fed by the loader. Tailings were removed by the scraper-loaders. Work was continued by Teck Corp. in 1981, when three D8K bulldozers, one 966C loader, one 235 backhoe, and four 627B scraper-loaders were used. The scraper-loaders were again used to mine, and the loader was used to feed the hopper of a vibrating screening unit. All material coarser than 2.5 cm (1 inch) was rejected. Material finer than 2.5 cm (1 inch) was processed through a modified three channel "Ross-300" sluice box capable of handling 115 cubic metres (150 cubic yards) of material per hour. More than 90% of the gold grains recovered were less than 5 mm (.2 inches) in diameter. Approximately 53,500 cubic metres (70,000 cubic yards) of material were stripped, and an additional 22,950 cubic metres (30,000 cubic yards) were mined and sluiced during 1981. Mining was not done in 1982, but an extensive program of ground preparation for future mining operations was done. Six employees worked using two D8K bulldozers, a 235 backhoe, and hydraulic monitors to strip 5.5 to 10.7 metres (18 to 35 feet) of black muck from an irregularly shaped cut 365 metres (1,200 feet) long with an area of approximately 47,500 square metres (510,000 square feet).

Gold from this portion of Sulphur Creek is reported to have a fineness of 790 to 813. Gold from this location is dull, and generally quite smooth. Some grains show poorly developed crystalline structure. In addition to gold, magnetite, botryoidal cassiterite (wood-tin), pyrite as cubes up to 2 cm (.8 inches) in diameter, hematite, and martite were also recovered from this site.

Lucky Lady Placers **(60)**
Sulphur Creek **115 O 10**
1981, 1982 **(Klondike)**
63° 44'N, 138° 51'W

This property is situated along the left limit of Sulphur Creek, just upstream from the mouth of Brimstone Gulch. Deposits present are up to 12 metres (40 feet) thick, and consist of up to 9 metres (30 feet) of silty colluvium overlying 3 metres (10 feet) of yellow, cross-laminated gravel. Few clasts in the gravel are larger than 10 cm (4 inches). Some old underground workings are present.

Work at this property was begun by R. Gibson in 1981, when stripping was done with a D7 bulldozer and a D9G bulldozer. Three people continued work in 1982 using the D7 and D9G bulldozers, and a 977 tracked loader. They mined a cut 30 metres (100 feet) wide, 60 metres (200 feet) long, and 12 metres (40 feet) deep. Gravel from the lower portion of the cut was processed through a sluice box with undercurrents running along part of its length. A monitor operated by a box tender was used to wash the gravel into the sluice box.

Mining at the 1982 cut of Lucky Lady Placers along Sulphur Creek. The tracked loader is transporting gravel from the cut to the sluice box.

R. Gibson **(61)**
D. Gritzka **115 O 15**
Sulphur Creek **(Klondike)**
1978, 1979, 1980 **63° 47'N, 138° 54'W**
1981, 1982

This property is situated along a left limit bench of Sulphur Creek immediately downstream from the mouth of Friday Gulch. Deposits are from 4.5 to 12.5 metres (15 to 41 feet) thick, and consist of 3.7 to 10.7 metres (12 to 35 feet) of mixed silt, black muck, and gravel, overlying .9 to 1.8 metres (3 to 6 feet) of brown, cross-bedded gravel. The section of mixed silt, black muck, and gravel includes discontinuous layers of grey-brown silt, black muck with wood fragments and roots, and closely packed clast-supported gravel with chlorite schist clasts. The gravel in the mixed section appears to have been deposited by Friday Gulch, while the underlying gravel, which carries better gold values, appears to have been deposited by Sulphur Creek. Bedrock is blocky-weathering schist.

Work was done at this location in 1978 by R. Gibson. He used a D7 bulldozer to strip and mine two cuts totalling 24 metres (80 feet) wide, and 50 metres (170 feet) long. The cuts were 4.6 to 5.5 metres (15 to 18 feet) deep. Water for sluicing was obtained from Friday Gulch. Mr. Gibson continued work in 1979. He used water to strip and the D7 bulldozer to mine two cuts 5.5 metres (18 feet) deep totalling 2,100 square metres (22,500 square feet). Work continued in 1980, when two people stripped and mined two cuts totalling 2,100 square metres (22,500 square feet). D. Gritzka and one helper took over the property in 1981. They used water and a Komatsu D65E bulldozer to strip and mine approximately 60,000 cubic metres (78,500 cubic yards) of material. Mr. Gritzka and four partners stripped and mined approximately 140,000

Hydraulicking to remove black muck from the D. Gritzka property along Sulphur Creek during 1982. A bulldozer was also used for stripping.

cubic metres (183,000 cubic yards) of material in 1982, using water, the Komatsu D65E bulldozer, and a D8 bulldozer. When stripping, the bulldozers pushed the thawed material to the center of the cut and the water was used to wash it to settling ponds along the left limit of Sulphur Creek in old dredge tailings. Water for sluicing was recirculated.

S. Rudniski (62)
Sulphur Gold Placers Ltd. 115 O 15
Sulphur Creek (Klondike)
1978, 1979, 1980 63° 47'N, 138° 54'W
1981, 1982

This property is situated along the left limit of Sulphur Creek, upstream from the mouth of Friday Gulch. Deposits are 6.1 to 7.3 metres (20 to 24 feet) thick, and consist of 5.5 to 6.1 metres (18 to 20 feet) of silt overlying 1.2 to 1.8 metres (4 to 6 feet) of clast-supported cross-bedded pebbly gravel with quartz and schist clasts. Bedrock is blocky-weathering to badly decomposed schist. The bedrock surface is irregular. There are old underground workings on the property.

Work at this location was done in 1978 by S. Rudniski who used a D7 bulldozer to dig a bedrock drain and do other preparatory work. In 1979, he and one helper used the D7 bulldozer to mine one cut of 700 square metres (7,500 square feet). They used the D7 bulldozer and a dragline in 1980 to mine two cuts totalling 2,500 square metres (27,000 square feet). Sulphur Gold Placers Ltd. took over the property in 1981. Two people used a D7 bulldozer to enlarge the cut. In 1982, three people worked, using a D7 bulldozer, and a D8K bulldozer. A sluice box 75 cm (30 inches) wide, and 9 metres (30 feet) long was used to process the gravel. A box tender used a monitor to wash gravel from the dump box into the sluice.

M. Crockett (63)
Sulphur Creek 115 O 15
1978, 1979, 1980 (Klondike)
1981, 1982 63° 49'N, 138° 56'W

This property is situated along Sulphur Creek, approximately 850 metres (2,800 feet) upstream from the mouth of Meadow Gulch. Deposits present are 6.1 to 9.8 metres (20 to 32 feet) thick, and consist of 2.4 to 3 metres (8 to 10 feet) of black muck overlying 0 to 3 metres (0 to 10 feet) of gravel, 1.2 metres (4 feet) of black muck, and 2.4 metres (8 feet) of clast-supported cross-bedded gravel. Bedrock is blocky weathering chlorite schist. The area has not been dredged, but old underground workings are present.

M. Crockett began work at this location in 1978, when he used a D8-14A bulldozer and water to do a limited amount of stripping. He continued stripping in 1979, and in 1980 when two cuts 150 metres (500 feet) and 90 metres (300 feet) long, and each 45 metres (150 feet) wide were stripped. Water was used to wash away the black muck as it thawed, while the bulldozer was used to push the upper gravel unit, where present, against the valley wall. Three people worked in 1981, using two D8 bulldozers to mine two cuts side by side across the full width of the valley. The area mined was 85 metres (280 feet) wide, and 58 metres (190 feet) long. Two D8 bulldozers and one D9H bulldozer were used by three people in 1982 to mine two more side by side cuts totalling 85 metres (280 feet) wide, and 100 metres (330 feet) long. Stripping was also done.

Meadow Placers (64)
Sulphur Creek 115 O 15
1979, 1980 (Klondike)
1981, 1982 63° 49'N, 138° 56'W

This property is situated along Sulphur Creek, approximately 1,450 metres (4,800 feet) upstream from the mouth of Meadow Gulch. The Sulphur Creek valley is narrow, and has steep slopes in this area. Deposits consist of 9 metres (30 feet) or more of black muck overlying 2.4 metres (8 feet) of gravel. Bedrock is blocky weathering chlorite schist.

Work at this property was begun in 1979, when N. Sprokkreeff used a D4 bulldozer, a D6C bulldozer, and a John Deere 440 loader to do a limited amount of stripping, and to rebuild an old dam at the upstream end of the property to create a water reservoir. In 1980, the D6C bulldozer, and a dragline with .4 cubic metre (.5 cubic yard) capacity were used to partially strip an area of 2,325 square metres (25,000 square feet). Work continued in 1981, when the same equipment was used to continue stripping. A limited amount of gravel was mined and sluiced. The D6C bulldozer, a D8 bulldozer, and the dragline were used by three people in 1982 to dig a drain, do stripping, and mine a cut of approximately 1,400 square metres (15,000 square feet).

Gold from this portion of Sulphur Creek is reported to have a fineness of 820 to 832.

D. Morgan (65)
Green Gulch 115 O 15
1979, 1980, 1981 (Klondike)
63° 50'N, 138° 54'W

This property is situated along Green Gulch, a left

limit tributary of Sulphur Creek. The Green Gulch valley is narrow, and has steep slopes.

D. Morgan began work at this location in 1979. Several test pits were dug. In 1980, he used a D4 bulldozer, a D7 bulldozer, and a John Deere 831 to strip along the right limit of the creek, and to build a dam just downstream from the forks of Green Gulch. He also mined and sluiced a small cut. Mr. Morgan did a limited amount of stripping and mining on the property in 1981.

N. Sprokkreeff (66)
Sulphur Creek 115 O 15
1979, 1980, 1981 (Klondike)
63° 50'N, 138° 56'W

This property is situated along the upstream portion of Sulphur Creek, approximately 1,050 metres (3,500 feet) upstream from the mouth of Green Gulch.

Work at this location was begun in 1979. A D4 bulldozer, a D6C bulldozer and a John Deere 440 loader were used to do stripping. The same equipment was used to do more stripping in 1980. In 1981, water was used to continue stripping the black muck present.

R and L Mining Co. (67)
Quartz Creek 115 O 14
1978, 1979, 1980 (Klondike)
1981, 1982 63° 49'N, 139° 04'W

This property is situated along Quartz Creek at the mouth of Little Blanche Creek. Deposits present include 6 to 12 metres (20 to 40 feet) of silt and black muck overlying 2.4 metres (8 feet) of gravel. Bedrock is quartz-sericite schist.

W. Rasmusson, working mostly along, mined a cut 75 metres (250 feet) wide and 120 metres (400 feet) long along the left limit of Quartz Creek. The cut was stripped previously. Mr. Rasmusson used two 46A bulldozers, two D8H bulldozers, and a Bucyrus-Erie 37B dragline with 1.3 cubic metre (1.75 cubic yard) capacity. He continued work at the cut in 1979. In 1980, three people used the same equipment to mine along the right limit of Quartz Creek. They continued work at that location in 1981. In 1982, work was done along the left limit of Little Blanche Creek, just upstream from its confluence with Quartz Creek. A ditch was dug, and stripping was done. Gravel was mined by bulldozer, and tailings from sluicing were stacked by the dragline.

Ballarat Mines Ltd. (68)
Bennford Mining 115 O 14
Arctic Rim Operators Ltd. (Klondike)
Quartz Creek 63° 48'N, 139° 05'W
1978, 1979
1980, 1981

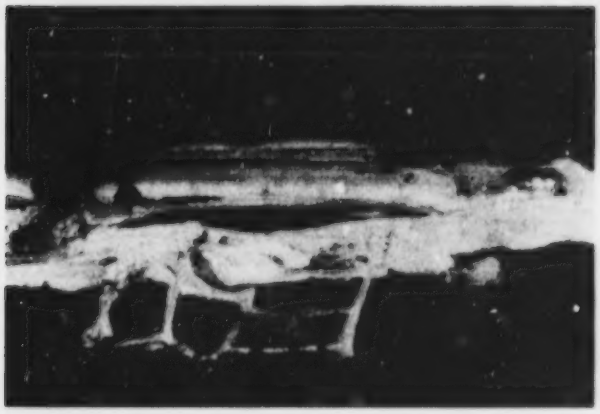
This property is situated along the right limit of Quartz Creek, between Claffey Pup and 19 Pup. Deposits lie on a bench approximately 12 metres (40 feet) above the present creek level, and are up to 24 metres (80 feet) thick. They consist of a thin layer of organic material and soil overlying brown gravel, and quartz-rich gravel analagous to the White Channel gravel of Hunker and Bonanza Creeks. Scouring, and a discontinuous layer of organic material, are present at the interface between the two gravel units. The lowermost 4 metres (13 feet) of the quartz-rich gravel is gold bearing. Bedrock is schist, with a small andesite dike crosscutting it.

Work on the property was done by Ballarat Mines Ltd. in 1978. Two D8 bulldozers were used to mine 25,250 cubic metres (33,000 cubic yards) of material from a cut 50 metres (165 feet wide), and 140 metres (460 feet) long. From 9.1 to 15.2 metres (30 to 50 feet) of material had been stripped previously from the cut, leaving a section 3.7 metres (12 feet) deep to be mined in 1978. Bedrock from the cut of 1,900 square metres (20,400 square feet) mined in 1977 was also cleaned. Benneford Mining took over the property in 1979, and worked with one D8H bulldozer, and two 627 scraper-loaders with 16 cubic metre (21 cubic yard) capacity. Stripping was done, and a large processing unit was built. A ramp with heavy grizzly was installed, so that the scraper-loaders could drive up the ramp and dump their loads through the grizzly into a hopper. When operating, the hopper fed a shaking screening unit, from which all material coarser than 1 cm (.4 inches) was rejected. Grains from .3 cm to 1 cm (.1 to .4 inches) in diameter were processed in one sluice box, while grains less than .3 cm (.1 inch) in diameter were divided between five other sluice boxes. The sluice boxes were 1.4 metres (4.5 feet) wide, and 6.1 metres (20 feet) long. Work continued in 1980, when Arctic Rim Operators Ltd. took over the property. Fifteen to twenty-five people worked on two shifts, using two D8 bulldozers, and five 627B scraper-loaders. They mined approximately 1,150,000 cubic metres (1,500,000 cubic yards) of material from two cuts. The cuts were about 65 metres (215 feet) wide, 305

View upstream along Little Blanche Creek at its mouth on Quartz Creek showing the workings of R and L Mining Co.

and 610 metres (1,000 and 2,000 feet) long, and up to 20 metres (65 feet) deep. Only the lowermost 4 metres (13 feet) of material were sluiced. Arctic Rim Operators Ltd. continued work in 1981 at a large cut immediately downstream from the mouth of Claffey Pup. Approximately 250,000 cubic metres (325,000 cubic yards) of material were stripped, and an additional 95,500 cubic metres (125,000 cubic metres) of gravel were mined and sluiced. No work was done on the property in 1982.

Gold from Quartz Creek is reported to have a fineness of 732 to 795.



View of Arctic Rim Operators Ltd. property on the right limit bench along Quartz Creek. The brown gravel and the underlying quartz-rich white gravel are clearly visible in the large cut. Four drained settling ponds are in the foreground.

Airgold Ltd. (69)
Ventures West Minerals Ltd. 115 O 14
Quartz Creek (Klondike)
1980, 1981, 1982 63° 47'N, 139° 06'W

This property is situated on the bench along the right limit of Quartz Creek, between 19 Pup and Calder Creek. Deposits are 6 to 29 metres (20 to 95 feet) thick, and consist of 0 to 4.6 metres (0 to 15 feet) of black muck overlying 6.1 to 27.4 metres of brown, and quartz-rich gravel. There is no organic material, and only a little scouring at the interface between the brown, and underlying gold-bearing quartz-rich gravel. The quartz-rich gravel is analagous to the White Channel gravel of Hunker and Bonanza Creeks. Bedrock is sericite schist. Numerous old underground workings are present in the area.

Work at this location was begun in 1980, when three people worked for Airgold Ltd. using a D8H bulldozer, and a 966C loader. They stripped 3.7 to 4.6 metres (12 to 15 feet) of material from a cut 90 metres (300 feet) square and mined and sluiced 2.4 metres (8 feet) of gravel from half of the cut stripped. Deposits at the 1980 workings were shallow. Ventures West Minerals Ltd. took over the property in 1981, and carried out an extensive program of vibratory and rotary drilling, and bulk sampling. In 1982, Ventures West Minerals Ltd. employed 20 people on two shifts. They used one D6D bulldozer, one D8K bulldozer, one D8L bulldozer, one 922B loader with 1.9 cubic metre (2.5 cubic yard) bucket, and three 637D scraper-loaders with 23.7 cubic metre (31 cubic yard) capacity to mine two cuts, each 365 metres (1,200 feet) long and 30 metres (100 feet) wide. The cuts were 700 metres (2,300 feet) apart. The southern cut had 6.1 to 9.1 metres (20 to 30 feet) of brown gravel overlying 6.1 metres (20 feet) of quartz-rich gravel, while the northern cut had 15.2 to 18.3 metres (50 to 60 feet) of brown gravel overlying 4 metres (13 feet) of quartz-rich gravel. Approximately 382,250 cubic metres (500,000 cubic yards) of material were stripped, and an additional 114,500 cubic metres (150,000 cubic yards) of gravel were mined and sluiced. Stripping was done by ripping the gravel, allowing it to thaw for a day, and loading and transporting it with the scraper-loaders. Gravel to be sluiced was mined the same way, and transported to a grizzly over a hopper, from which a trommel was fed. Grains less than 1 cm (.4 inches) in diameter were divided between between one of six sluice boxes for sluicing. Sluicing water was impounded in a series of 9 settling ponds.

Risby & Sons Mining (70)
Indian River 115 O 14
1981, 1982 (Klondike)
63° 45'N, 139° 08'W

This property is situated along a right limit bench of Indian River, immediately downstream from the mouth of Quartz Creek. Deposits are up to 6 metres (20 feet) thick, and consist of 1.8 to 2.4 metres (6 to 8 feet) of yellow gravel with well developed cross-bedding and channel features, and clasts up to 15 cm (6 inches) in diameter, overlying a discontinuous layer up to 1.2 metres (4 feet) thick of laminated silty clay, and to 2.4 metres (0 to 8 feet) of gold-bearing matrix-supported imbricated quartz-rich sandy gravel with clasts up to 10 cm (4 inches) in diameter. Channels cut the top of both the lower gravel and the silty clay units. Bedrock is sericite schist. The bedrock suface is irregular.

P. Risby and two helpers began work at this location in 1981. Five people continued work in 1982, using a D8H bulldozer and Fiat-Allis 945B loader to mine on two shifts. The bulldozer was used to mine and stockpile the gravel, while the loader was used to feed the sluice box. All the material mined was sluiced through a three channel sluice box, with grains finer than 1.3 cm (.5 inch) being processed in the side channels, and grains coarser than 1.3 cm (.5 inch) being processed in the centre run. The capacity of the sluice box was approximately 45 cubic metres (60 cubic yards) per hour. Tailings were removed by the bulldozer.

Gold from the Indian River is reported to have a fineness of 843. Gold from this location is fine-grained, and flat. Well-worn magnetite, and angular pink garnet are also recovered from the deposits at this site.

Greenwall Brothers Contractors Ltd. (71)
Indian River 115 O 14
1982 (Klondike)
63° 45'N, 139° 08'W

This property is situated along a low right limit bench of Indian River, approximately 300 metres (1,000 feet) downstream from the mouth of Quartz Creek. Deposits consist of cross-bedded yellow gravel, overlying discontinuous layers of silt, and gold-bearing quartz-rich gravel.

Greenwall Bros. Contractors Ltd. moved to this location midway through the 1982 season after mining at a site approximately 2,600 metres (1.6 miles) upstream along the Indian River. Two people worked using a Komatsu D85A bulldozer, and a single channel sluice box.

Greenwall Brothers Construction (72)
Indian River 115 O 11
1982 (Klondike)
63° 45'N, 139° 05'W

This property is situated along a right limit bench of Indian River, approximately 2,000 metres (6,550 feet) upstream from the mouth of Quartz Creek. The bench is approximately 12 metres (40 feet) above the present level of Indian River. Deposits on the bench are approximately 13.7 metres (45 feet) thick, and consist of cross-bedded and channelled quartz-rich gravel with clasts up to 10 cm (4 inches) in diameter. The gravel is stained by iron and manganese oxides close to its base.

Work was done by two people working with a Komatsu D85A bulldozer, and a loader during part of the 1982 season. Gravel was processed in a single channel sluice box. Tailings were dumped along the edge of the Indian River valley, below the bench.

Cross-bedded quartz-rich gravel on the bench along the right limit of Indian River. Dark areas are stained by iron and manganese oxides.

White Channel Gold (73)
Indian River 115 O 11
1982 (Klondike)
63° 44'N, 139° 04'W

This property is situated along a right limit bench of Indian River, approximately 2,750 metres (9,000 feet) upstream from the mouth of Quartz Creek. Deposits consist of a layer of brown gravel of variable thickness overlying 10.7 metres (35 feet) of cross-bedded quartz-rich gravel with clasts up to 15 cm (6 inches) in diameter, and abundant sandy lenses. Channels cut the quartz-rich gravel at the base of the yellow gravel.

Work at this location was begun in 1982. An access road was built from Quartz Creek, and other preparatory work was done. A cut of approximately 15,300 cubic metres (20,000 cubic yards) of material was mined, and the gravel was processed through a "Ross" three channel sluice box with a capacity of 380 cubic metres (500 cubic yards) per hour. Tailings were dumped along the edge of the Indian River Valley at the foot of the bench. Sluicing water was impounded in a cut-off meander of Indian River. The amount of gold recovered was much less than expected, and work was halted midway through the season.

J.P. Monfette (74)
S. Downen 115 O 14
Eldorando Creek (Klondike)
1980, 1981 63° 52'N, 139° 12'W

This property is situated at the headwaters of Eldorado Creek. The Eldorado Creek valley is narrow, and has steep slopes at this site. Deposits consist of 6 metres (20 feet) of black muck overlying 3 metres (10 feet) of gravel.

J.P. Monfette used a D8 bulldozer to do stripping on this property in 1980. In 1981, S. Downen and one helper worked by hand. They processed the gravel mined through a sluice box 40 cm (16 inches) wide and 2.4 metres (8 feet) long. Water for sluicing was gravity-fed from a reservoir, and was retained in one settling pond after sluicing.

J.P. Monfette (75)
Eldorado Creek 115 O 14
1978, 1979 (Klondike)
63° 52'N, 139° 13'W

This property is located along the headwaters of

Eldorado Creek, approximately 1,000 metres (3,300 feet) upstream from its confluence with Chief Gulch. The centre of the valley has old open-cut workings.

J.P. Monfette staked this property in 1976. In 1978, he used a D7 bulldozer to do some stripping, and did some drift mining along the right limit of the creek. He used the D7 bulldozer in 1979, and a D3 bulldozer and 920 loader with 2.3 cubic metre (3 cubic yard) bucket in 1980 to strip and mine a cut 24 metres (80 feet) wide, 90 metres (300 feet) long, and 4.6 metres (15 feet) deep. Water for sluicing was recirculated.

Gold from this site does not appear worn. Many grains enclose quartz. Magnetite, pyrite, and limited amounts of scheelite are also recovered. Some pyrite grains enclose small pieces of gold.

G. Roe (76)
Eldorado Creek 115 O 14
1978, 1979, 1980 (Klondike)
1981, 1982 63° 52'N, 139° 14'W

This property is situated along the upper part of Eldorado Creek, approximately 350 metres (1,150 feet) upstream from the mouth of Chief Gulch.

G. Roe and one helper began work at this location in 1978. In 1978, and 1979, they did preparatory work and testing. They used a 920 loader with 1.5 cubic metre (2 cubic yard) bucket to mine during 1980 and 1981, and part of 1982.

Eldorado Placers (77)
Chief Gulch 115 O 14
Eldorado Creek (Klondike)
1978, 1979, 1980 63° 52'N, 139° 15'W
1981, 1982

This property is situated along Chief Gulch, at, and upstream from its confluence with Eldorado Creek. Deposits present consist of tailings from early hand mining operations, and from bulldozer mining done first by G. Franklin, and then by J. Lamontagne, and of 3 to 9 metres (10 to 30 feet) of black muck with sand and sandy gravel lenses and abundant tree fragments overlying 1 to 3 metres (3 to 10 feet) of clast-supported cross-bedded gravel with silty lenses. Bedrock is chlorite schist.

Two people worked at this location in 1978. They stripped and mined 4 cuts totalling approximately 2,000 square metres (21,500 square feet). They continued work in 1979, using three bulldozers. In 1980 three people worked using one D6 bulldozer and one D8H bulldozer for part of the season, and two D8H bulldozers for the rest of the season. Work continued in 1981, when three people mined using the two D8H bulldozers. The same equipment was used by three people in 1982 to mine a cut 30 metres (100 feet) wide and 90 metres (300 feet) long across the full width of the valley. Black muck was stripped, and about 3 metres (9 feet) of gravel was mined and sluiced through a single-channel sluice box. Water for sluicing was recirculated.

Bonanza Mining Company (78)
Eldorado Creek 115 O 14
1980, 1981 (Klondike)
63° 52'N, 139° 15'W

This property is situated along Eldorado Creek, at the mouth of Golden Gulch. Deposits present consist of tailings from former dredge mining operations. Bedrock is quartz-sericite schist.

W. Graves and one helper worked at this location in 1981 using a 920 loader to mine approximately 15,250 cubic metres (20,000 cubic yards) of old dredge tailings. In 1981, Mr. Graves and one helper used a D7 bulldozer and the 920 loader to mine approximately 23,000 cubic metres (30,000 cubic yards) of tailings. Because they had only one claim 150 metres (500 feet) long on which to work, they were obliged to transport material mined from the downstream end of the claim to a stockpile at the upstream end of the claim prior to sluicing. Tailings were then stacked in the newly mined cut. A single channel sluice box 45 cm (18 inches) wide was used for sluicing.

Eldorado Mining (79)
Eldorado Creek 115 O 14
1981, 1982 (Klondike)
63° 52'N, 139° 16'W

This property is situated along Eldorado Creek at the mouth of Gay Gulch. Deposits consist mainly of tailings from former former bulldozer mining operations, although there is some gravel along the right and left limits of the creek. Shafts from former underground mining operations are present in those areas.

D. Johnson and two helpers worked at this location in 1981 using a D8K bulldozer to mine approximately 30,600 cubic metres (40,000 cubic yards) of material from a cut immediately downstream from the mouth of Gay Gulch. Three people continued work in 1982 using a D8K bulldozer to mine a cut 30 metres (100 feet) wide and 180 metres (600 feet) long across the full width of the valley immediately upstream from the mouth of Gay Gulch. The 34,400 cubic metres (45,000 cubic yards) of material mined were sluiced in a three channel "Pearson" sluice box. Sluicing water, along with the full flow of water in Eldorado Creek was impounded in a primary settling pond. Overflow from that settling pond went to a secondary settling pond from which the overflow went back to Eldorado Creek. Sluicing water was recirculated from the secondary settling pond.

Beron Placers (80)
Eldorado Creek 115 O 14
Gay Gulch (Klondike)
1978, 1979, 1980 63° 52'N, 139° 16'W
1981, 1982

This property is situated along Gay Gulch, and along Eldorado Creek at the mouth of Gay Gulch. The Gay Gulch valley is narrow and has steep slopes, and a steep gradient. Deposits are from 1.8 to 12 metres (6 to 40 feet) thick, and consist of colluvium overlying black muck with abundant tree fragments and gravel lenses, and 1.2 to 1.8 metres (4

to 6 feet) of clast-supported gravel with most clasts about 15 cm in diameter. Slabs of chlorite schist are present in the colluvium, especially along the right limit of the creek. Bedrock is blocky-weathering chlorite schist. Early mining operations at this site include open-cut mining using a horse with dragline bucket, and, along the left limit, underground mining. Deposits present along Eldorado Creek include tailings from former dredge mining operations, and gravel on a left limit bench 40 metres (130 feet) above the present creek level. The chlorite schist bedrock surface of the bench slopes at 6° toward the present creek.

Work at this property began on the bench along Eldorado Creek in 1977. In 1978, B. and R. Johnson mined a test cut of approximately 765 cubic metres (1,000 cubic yards) using a D4 bulldozer. They began work on Gay Gulch in 1979, using a D6 bulldozer and a 950 loader with 2.3 cubic metre (3 cubic yard) bucket. The material mined was processed through a sluice box with undercurrents part way along its length. The sluice box had a capacity of approximately 38 cubic metres (50 cubic yards) of material per hour. Work was continued using the same equipment during 1980. Three long, narrow cuts totalling 3,800 square metres (41,000 square feet), and averaging 6 metres (20 feet) deep were mined. Sluicing water was impounded in a primary settling pond at the mouth of Gay Gulch. Overflow from the primary settling pond went to a larger secondary settling pond, and from there to Eldorado Creek. Water for sluicing was recirculated from the secondary settling pond. In 1981, B. and R. Johnson used the same equipment to mine several cuts 9 metres (30 feet) wide, and totalling 410 metres (1,350 feet) in length along the left limit of the creek. Two cuts 15 metres (50 feet) wide and 150 metres (500 feet) long each were mined using the same equipment in 1982. Sluicing water was impounded in one large pond at the mouth of Gay Gulch, from which it was recirculated.

Gold from Gay Gulch is reported to have a fineness of 780. Magnetite and pyrite were also recovered from the deposits at this site.

J. Vail (81)
D. Keech 115 O 15
J. Simpson (Klondike)
Gay Gulch 63° 53'N, 139° 15'W
1978, 1979, 1980
1981, 1982

This property is located along the middle portion of Gay Gulch. Deposits present in the narrow valley, which has steep slopes and a steep gradient, are up to 6.7 metres (22 feet) thick, and consist of .6 metres (2 feet) of colluvium and black muck overlying up to 6.1 metres (20 feet) gravel. Bedrock is chlorite-quartz schist with quartz veins and lenses.

Work at this site was begun in 1978 by J. Vail and D. Keech. They used a Case 350 bulldozer to mine a cut 6.1 to 9.1 metres (20 to 30 feet) wide, and 45 metres (150 feet) long. The material mined was processed through a sluice box 50 cm (20 inches) wide, and 7.3 metres (24 feet) long. Water for sluicing was recirculated from a settling pond to a holding pond upstream from the sluice box. The Case 350 bulldozer, and a Komatsu D31 tracked loader with .75 cubic metre (1 cubic yard) bucket were used to mine a cut approximately 3 metres (10 feet) wide and 30 metres (100 feet) long in 1979. The same equipment was used to strip and mine larger cuts in 1980 and 1981. J. Simpson took over the property in 1982. He used the Case 350 bulldozer to do stripping, and the Komatsu D31 tracked loader to mine, feed the sluice box, and stack tailings. A vibrating screening unit was used to remove all material coarser than 2.5 cm (1 inch) in diameter prior to sluicing.

W. Weigand (82)
G. Caley 115 O 14
Eldorado Creek (Klondike)
1981 63° 53'N, 139° 17'W

This property is located along Eldorado Creek, approximately 550 metres (1,800 feet) downstream from the mouth of Gay Gulch. Deposits consist of tailings from former bulldozer mining operations.

Three people worked at this site in 1981 using one D7E bulldozer, one D8K bulldozer, and one 950 loader with 2.7 cubic metre (3 cubic yard) bucket. Several cuts along the right limit of the creek were mined. Sluicing water was impounded in two small settling ponds.

Klondike Mining Company (83)
Eldorado Creek 115 O 14
Nugget Gulch (Klondike)
1980, 1981 63° 53'N, 139° 18'W

This property is situated along Eldorado Creek between Nugget Gulch and Oro Grande Gulch. It includes the mouth of Nugget Gulch. Deposits along Eldorado Creek consist of tailings from former bulldozer mining operations, bordered by previously unmined deposits. Along Nugget Creek at its mouth they consist of 2 to 4 metres (6 to 13 feet) of black muck overlying 2 to 3 metres (6 to 10 feet) of clast-supported gravel. Bedrock is blocky-weathering quartz-chlorite schist.

Work at this location in 1980 was done by twelve people working on two shifts with one D8 bulldozer, one Terex 8240 bulldozer, three loaders, one Koehring 1066 backhoe with 1.9 cubic metre (2.5 cubic yard) bucket, and one Hopto 311 backhoe with 1.5 cubic metre (2 cubic yard) bucket. One cut of approximately 15,300 cubic metres (20,000 cubic yards) was mined from Nugget Gulch, but work was halted because the narrow Nugget Gulch valley was too confined for the equipment being used. A cut was also mined along Eldorado Creek. The material mined was processed through a vibrating screening unit which removed all grains coarser than 2.2 cm (.9 inches) prior to sluicing in a pair of sluice boxes 1.2 metres (4 feet) wide, and 12 metres (40 feet) long. Mining continued in 1981 when twelve employees worked on two shifts. They used one D8 bulldozer, one D9 bulldozer, one Terex 8240 bulldozer, one 966 loader, two Koehring 1066 backhoes, and one Hopto 311 backhoe to mine approximately 115,000 cubic metres (150,000 cubic yards) of material. The material mined was again processed through the vibrating screening unit and the pair of sluice boxes.

Gold from Eldorado Creek is reported to have a fineness of 703 to 803. Gold recovered from the mouth of Nugget Gulch is well worn. Some gold grains have

inclusions of quartz. A few are arborescent crystalline aggregates. Gold recovered from the mouth of Oro Grande Gulch is similar in appearance to gold from Nugget Gulch, but does not have inclusions of quartz. Gold from Oro Grande Gulch is reported to have a fineness of 775.

High Gravity Resources Ltd. **(84)**
Nugget Gulch **115 O 14**
1982 **(Klondike)**
63° 53'N, 139° 18'W

This property is situated along Nugget Gulch near its confluence with Eldorado Creek. Deposits in the narrow, steep valley consist of 1.8 to 3.6 metres (6 to 12 feet) of black muck with abundant tree fragments overlying 1.8 to 2.7 metres (6 to 9 feet) of clast-supported gravel. Bedrock is blocky-weathering siliceous schist.

Work at this location was done using a D9H bulldozer to strip overburden and mine and push gravel to the sluice box, and a 966 loader with 2.7 cubic metre (3.5 cubic yard) bucket to feed the sluice box. A single-channel sluice box 1.2 metres (4 feet) wide and 12 metres (40 feet) long with stationary grizzly was used to process the gravel. The cut mined was approximately 7.5 metres (25 feet) wide, 150 metres (500 feet) long, and 4.5 metres (15 feet) deep.

View downstream along Nugget Gulch of the cut mined by High Gravity Resources Ltd. during 1982.

Granville Placers **(85)**
Eldorado Creek **115 O 14**
1978, 1979 **(Klondike)**
1980, 1981 **63° 53'N, 139° 18'W**

This property is located along Eldorado Creek, just downstream from the mouth of Nugget Gulch. Deposits in the centre of the valley consist of tailings from the early bulldozer mining operations of G. Franklin. Deposits along the edges of the valley consist of gravel covered by a thick layer of black muck with tree fragments.

Work was begun by Granville Placers in 1978 when D. Rintoul mined approximately 3,800 cubic metres (5,000 cubic yards) of tailings from along the left limit of Eldorado Creek. Work continued in 1979, when a D8 bulldozer and a small Allis-Chalmers loader were used to mine old tailings. In 1980, the same equipment was used by four people to mine old tailings along the right limit of the creek. Work continued in 1981, when S. Mynott used the D8 bulldozer to mine approximately 13,750 cubic metres (18,000 cubic yards) of old tailings.

G. Stephenson **(86)**
Eldorado Creek **115 O 14**
1981, 1982 **(Klondike)**
63° 53'N, 139° 18'W

This property is situated along Eldorado Creek at the mouth of Little Eldorado Creek. Deposits present consist of up to 3 metres (10 feet) of tailings from former dredge mining operations.

Work at this location was begun in 1981 by G. Stephenson and two helpers. They used a 920 loader to dig a diversion ditch, construct a water reservoir and settling pond, and mine tailings. A D8H bulldozer and the 920 loader were used in 1982 to mine approximately 15,300 cubic metres (20,000 cubic yards) of dredge tailings, which were sluiced in a single-channel sluice box 1.2 metres (4 feet) wide and 9.8 metres (32 feet) long. At the end of the sluice box, grains less than 1 cm (.4 inches) in diameter passed through a piece of punch plate, and were sluiced in an additional 2.4 metre (8 feet) long sluice box.

J. Archibald **(87)**
R. Archibald **115 O 14**
Eldorado Creek **(Klondike)**
1978, 1979, 1980 **63° 54'N, 139° 19'W**
1981, 1982

This property is situated along Eldorado Creek at, and just downstream from the mouth of French Gulch. Deposits consist mainly of frozen tailings up to 10 metres (33 feet) thick from 1927 dredging operations. Some previously unworked ground is present along the left limit of the creek. Tailings from hydraulic mining operations on French Hill cover part of the area. Bedrock is quartz-chlorite-sericite schist, and black carbonaceous pyritic schist. Parts of the quartz-chlorite-sericite schist are badly decomposed.

Work at this location was begun by J. Archibald, R. Archibald and one helper in 1978. They dug a drain 450 metres (1,500 feet) long, and stripped and mined approximately 13,750 cubic metres (18,000 cubic yards) of material from a cut of 3,150 square metres (33,750 square feet). Bedrock was not reached. Two D6B bulldozers were used for the work. In 1979, two D6 bulldozers and a 980B loader were used to strip and mine approximately 19,100 cubic metres (25,000 cubic yards) of dredge tailings from Eldorado Creek and hydraulic tailings from French Hill. The same equipment was used in 1980, when approximately 25,250 cubic metres (33,000 cubic yards) of material were mined. A reservoir on French Gulch which stored water for sluicing was enlarged. One D6 bulldozer and one 980B loader were used in 1981 to strip approximately 15,300 cubic metres (20,000 cubic yards) of material, and to mine an additional equal amount for sluicing. The water

reservoir on French Gulch was enlarged further, and a settling pond 6 metres (20 feet) wide and 600 metres (2,000 feet) long was built in dredge tailings along the left limit of Eldorado Creek. The same equipment was used to continue work in 1982.

In addition to gold, abundant pyrite, some magnetite, and limited amounts of botryoidal cassiterite ("wood-tin") and barite are recovered from the deposits at this site.

Tundra Contracting (88)
Eldorado Creek 115 O 14
1981, 1982 (Klondike)
63° 54'N, 139° 19'W

This property is situated along Eldorado Creek, at the mouth of Irish Gulch. Deposits present consist of tailings from former dredging operations in the valley bottom, a section of colluvium, black muck, and gravel along a low left limit bench immediately upstream from the mouth of Irish Gulch, and quartz-rich White Channel gravel on Irish Hill, immediately downstream from the mouth of Irish Gulch. Bedrock is quartz-sericite schist.

Work at this location was begun in 1981 by Tundra Contracting. Five people worked using one D8 bulldozer and one 966 loader with 3 cubic metre (4 cubic yard) bucket. They mined approximately 7,650 cubic metres (10,000 cubic yards) of material from along the low left limit bench during the first part of the season, and then mined approximately 84,000 cubic metres (110,000 cubic yards) of material from Irish Hill during the remainder of the season. A vibrating screening unit was used to remove all grains coarser than 2.5 cm (1 inch) prior to sluicing in the single channel sluice box. Tailings from sluicing were dumped over the edge of Irish Hill into the Eldorado Creek valley. Deposits along the low left limit bench, and up the slope from it were mined during 1982. The area mined was approximately 13,900 square metres (150,000 square feet).

Elkhorn Resources (89)
E. Geese 115 O
Eldorado Creek (Klondike)
1980, 1981, 1982 63° 55'N, 139° 19'W

This property is situated on a low left limit bench along Eldorado Creek, approximately 600 metres (2,000 feet) upstream from its confluence with Bonanza Creek. Deposits present consist of a wedge of colluvium with some tailings from early hydraulic mining operations on Gold Hill overlying up to 6 metres (20 feet) of layered black muck with ice lenses, and 0 to 1 metre (0 to 3 feet) of gravel. Bedrock is schist, with some decomposed sections. There are old underground workings in the area.

Elkhorn Resources worked along the low left limit bench in 1980. E. Geese and one helper began mining downstream from the Elkhorn Resources workings in 1981. They used one D7 bulldozer, and one 235 backhoe to mine a cut 9 metres (30 feet) wide, 215 metres (700 feet) long, and from .6 to 9 metres (2 to 30 feet) deep. Material was pulled down from the face of the cut by the backhoe, stockpiled by the bulldozer, and fed to the sluice box by the backhoe. It passed first over a grizzly with 12.5 cm (5 inches) spaces. Grains less than 12.5 cm (5 inches) in diameter were then washed through a trommel with 1 cm (.5 inches) holes. Undersize from the trommel was sluiced in one of a series of parallel sluice boxes 1 metre (3 feet) long. All water from sluicing was recirculated. Mr. Geese and one helper continued mining along the left limit bench during 1982, using a D7 bulldozer and a loader.

King Solomon Mines (90)
A. Fry 115 O 14
D. Fry (Klondike)
Eldorado Creek 63° 55'N, 139° 20'W
1978, 1979, 1980

This property is situated on Eldorado Creek, just above its confluence with Bonanza Creek. Deposits mined came from several different sites on the property.

During the spring of 1978, Mr. A. Fry used a D8 bulldozer to mine a cut 15 metres (50 feet) wide, 60 metres (200 feet) long and 4 metres (14 feet) deep from Gold Hill while water was available from spring run-off for sluicing. Gold Hill is a high level bench along the left limit of Eldorado Creek on which "White Channel" gravel deposits occur. Work was also done in 1978 using a D7 and a D8 bulldozer to mine a cut 15 metres (50 feet) wide, 60 metres (200 feet) long and 5 metres (16 feet) deep from a low level bench approximately 3 metres (10 feet) above the present creek level along the left limit of Eldorado Creek. The section in the cut consisted of gravel and clay-rich colluvium. Both were sluiced. A monitor was used to direct water into the sluice to break up the clay. A third cut was made in 1978 with a D7 bulldozer. The cut was 6 metres (20 feet) wide and 30 metres (100 feet) long. It was situated on a low right limit bench along Eldorado Creek. In 1979, work was done along the edge of Gold Hill, and on the slope from Gold Hill to Eldorado Creek. Shallow gravel deposits and a few feet of bedrock were mined from an irregular area of approximatey 9,000 square metres (95,000 square feet) at the north end of the hill. The cut was extended to the south in 1980. The area mined in 1980 was approximately 6,500 square metres (70,000 square feet). Three people worked, using a D7 and a D8 bulldozer to mine a stockpile material, and to push away tailings. A 980B loader was used to feed the sluice box. Water for sluicing was gravity fed during spring run-off, and pumped during the rest of the season.

J.P. Monfette (91)
Ready Bullion Gulch 115 O 14
1981, 1982 (Klondike)
63° 53'N, 139° 09'W

This property is situated along the narrow and steep valley of the upper reaches of Ready Bullion Gulch.

J. P. Monfette and one helper began mining at this location in 1981, using a 933 tracked loader. They did preparatory work, and mined one small cut. Work at the property continued in 1982.

In addition to gold, pyrite and minor amounts of scheelite were recovered from this location.

D. Coombs (92)
Ready Bullion Gulch 115 O 14
Bonanza Creek (Klondike)
1978, 1979, 1980 63° 53'N, 139° 08'W
1981, 1982

This property is situated along Ready Bullion Gulch at, and just upstream from its confluence with Bonanza Creek, and along Bonanza Creek just downstream from the mouth of Ready Bullion Gulch. Deposits present consist of .9 to 2.4 metres (3 to 8 feet) of colluvium with gravel lenses overlying 0 to .9 metres (0 to 3 feet) of gravel, and .6 to 1.5 metres (2 to 5 feet) of broken bedrock. Bedrock is chlorite-quartz schist. Tailings from early bulldozer mining operations including those of A. and A. Coulombe between 1954 and 1956 extend approximately 1,500 metres (5,000 feet) upstream along Ready Bullion Gulch from its mouth. Tailings from hand mining operations extend even further upstream.

D. Coombs continued mining at this location, where he began work in 1974. He mined a cut 9 metres (30 feet) wide, 90 metres (300 feet) long, and 2.4 metres (8 feet) deep along the left limit of Bonanza Creek, immediately downstream from the mouth of Ready Bullion Gulch during 1978. He used a 966 loader, and a conventional single channel sluice box rather than the elevated sluice box he had used previously. In 1979, Mr. Coombs mined approximately 3,800 cubic metres (5,000 cubic yards) of material from Bonanza Creek and Ready Bullion Gulch. Up to 1.8 metres (6 feet) of bedrock were mined and sluiced, as gold is found throughout the broken bedrock. Work in 1980 was done using one D7 bulldozer, a 966 loader, a small Allis-Chalmers loader, and a Case 930 backhoe-front end loader. Approximately 750 cubic metres (1,000 cubic yards) of material were mined from Bonanza Creek and Ready Bullion Gulch. Work was also done on a small water reservoir, and a diversion ditch. Mr. Coombs continued work on Ready Bullion Gulch in 1981 and 1982.

Gold from Ready Bullion Gulch is typically coarse, and has a nubbly texture which does not appear worn. It has been reported previously to have a fineness of 710 to 717, but Mr. Coombs reports that near the mouth of the creek it has a fineness of 779. In addition to gold, fine-grained pyrite and minor amounts of galena are recovered from Ready Bullion Gulch. Gold from the upstream portion of Bonanza Creek has been reported previously to have a fineness of 809 to 827. Mr. Coombs reports that at the mouth of Ready Bullion Gulch, it has a fineness of 834. Magnetite is recovered along with gold from Bonanza Creek.

Bonar and Young Mining Co. (93)
Bonanza Creek 115 O 14
1980 (Klondike)
63° 54'N, 139° 08'W

This property is situated on upper Bonanza Creek approximately 450 metres (1,500 feet) below its confluence with Ready Bullion Gulch.

K. Conditt worked on the property with an International HD21 bulldozer in 1980. He did stripping in preparation for future mining operations.

A. Conway (94)
Northwest Consolidated Industries Ltd. 115 O 14
Bonanza Creek (Klondike)
1978, 1979, 1980 63° 55'N, 139° 09'W

This property is situated on upper Bonanza Creek above Carmack Fork. It has not been dredged.

Stripping was done on the property in 1978 and 1979 by Mr. Conway. Northwest Consolidated Industries did further stripping, and test work on the downstream half of the property in 1980.

J. Bryde (95)
Bonanza Creek 115 O 14
1982 (Klondike)
63° 55'N, 139° 09'W

Deposits at this locality, which is on the right limit of upper Bonanza Creek just above its confluence with Carmacks Fork, consist of 2.5 metres (8 feet) of sandy gravel. Bedrock is slabby-weathering schist with near-vertical foliation.

Work was begun at this property in 1982. A small area was stripped mechanically of overburden, and a limited amount material was mined by hand. Gravity-fed water was used for sluicing.

J. Langevin (96)
M. Langevin 115 O 14
Victoria Gulch (Klondike)
1978, 1979, 1980, 63° 55'N, 139° 13'W
1981, 1982

This property is situated along Victoria Gulch, approximately 450 metres (1,500 feet) upstream from its confluence with Bonanza Creek. Victoria Gulch is a narrow valley with steep slopes, and a steep gradient. Deposits present consist of 1 to 2 metres (3 to 7 feet) of black muck overlying 2 metres (7 feet) of cross-bedded sandy gravel. One horizon close to bedrock has boulders up to 60 cm (24 inches) in diameter. Bedrock is blocky-weathering quartz-sericite schist.

J. Langevin and M. Langevin mined part time at this location from 1978 to 1982, using a small John Deere 1010 bulldozer, and backhoe with 56 litre (2 cubic foot) bucket. They did not sluice during 1982, but used a rented D8 bulldozer to push gravel from the right and left limits of the creek into the previously mined cut along the center of the valley in preparation for future sluicing. The cut prepared was approximately 20 metres (65 feet) wide, and 60 metres (200 feet) long.

Gold from Victoria Gulch is reported to have a fineness of 807 to 820. Gold recovered from this location is granular, and appears worn. In addition to gold, magnetite, pyrite, martite, and barite are recovered from the deposits along Victoria Gulch.

Hawk Mining (97)
Victoria Gulch 115 O 14
1978, 1979, 1980 (Klondike)
63° 54'N, 139° 13'W

This property is situated along Victoria Gulch, approximately 650 metres (2,150 feet) upstream from its confluence with Bonanza Creek. Deposits are shallow in the centre of the valley, but thicken rapidly along both limits due to the steep valley walls. Tailings from old hand mining operations are present.

Work at this location was begun in 1978. Water was used to strip black muck, and a Case 650 backhoe was used to do other preparatory work. W. Hawkes and two helpers worked in 1979 using a D8K bulldozer and a 950 loader with 2.3 cubic metre (3 cubic yard) bucket to mine one cut. The bulldozer was used to mine and stockpile gravel, while the loader was used to feed the sluice box and to remove tailings. Mr. Hawkes and two helpers used the same equipment to mine a second cut in 1980.

L. Vezina (98)
Victoria Gulch 115 O 14
1981 (Klondike)
63° 54'N, 139° 13'W

This property is located along Victoria Gulch, approximately 800 metres (2,625 feet) upstream from its confluence with Bonanza Creek.

L. Vezina and one helper began work at this site in 1981. They used an Allis-Chalmers HD4 tracked loader to construct a water reservoir and a settling pond, to mine and stockpile gravel, and to remove tailings. The gravel was shovelled into the sluice box by hand. Water for sluicing was gravity-fed.

D. Fosse (99)
Victoria Gulch 115 O 14
1981 (Klondike)
63° 54'N, 139° 13'W

This property is located along Victoria Gulch, approximately 150 metres (500 feet) upstream from the mouth of 7 Pup.

D. Fosse did preparatory work and a limited amount of mining at this site in 1981. He used a tracked loader with 1.1 cubic metre (1.5 cubic yard) bucket.

L. Beck (100)
Victoria Gulch 115 O 14
1981, 1982 (Klondike)
63° 54'N, 139° 13'W

This property is situated along Victoria Gulch, approximately 300 metres (1,000 feet) upstream from the mouth of 7 Pup. The area has previously been mined by hand. Some bulldozer mining was also done between 1960 and 1970.

L. Beck began work at this location in 1981. He used a D6 bulldozer to do stripping. Mr. Beck continued preparatory work in 1982 using the D6 bulldozer.

G. Anderson (101)
Victoria Gulch 115 O 14
1980, 1981, 1982 (Klondike)
63° 54'N, 139° 13'W

This property is situated along Victoria Gulch, just downstream from the mouth of 11 Pup.

G. Anderson began work at this location in 1980. He used a John Deere 440 bulldozer to build a dam just downstream from the confluence of Victoria Gulch and 11 Pup to provide a reservoir for water, and to mine and stockpile gravel. The gravel was shovelled by hand into a sluice box 30 cm (12 inches) wide, and 6 metres (20 feet) long. Water for sluicing was gravity fed. Mr. Anderson continued work in 1981 and 1982. He was unable to sluice in 1982, however, due to low water levels.

P. Geysler (102)
7 Pup 115 O 14
1980, 1981, 1982 (Klondike)
63° 54'N, 139° 14'W

This property is situated along 7 Pup, a steep left limit tributary of Victoria Gulch. The creek has its headwaters on the Lone Star lode gold occurrence.

P. Geysler worked at this location in 1980 and 1981, using a D3 bulldozer. He worked at the property for only a short time during 1982.

Gold from 7 Pup is reported to be rough and hackly, and to have inclusions of quartz.

F. Chapil (103)
Prince Albert Mines Ltd. 115 O 14
Bonanza Creek (Klondike)
1979, 1980, 1981 63° 55'N, 139° 13'W

This property is situated on upper Bonanza Creek, above McKay Gulch. A previously unmined strip of gravel along the right limit of the creek between the area dredged and the valley wall, and slightly higher than the present creek level, was the target of work in 1979, 1980, and 1981. Bedrock is blocky-weathering sericite-chlorite schist.

F. Chapil mined a small cut approximately 300 metres (1,000 feet) upstream from the mouth of McKay Gulch using a small backhoe in 1979. In 1980, he did some further work at the same site. Prince Albert Mines Ltd. took over the property in 1981. Six employees worked on two shifts with a D8K bulldozer and a 966 loader. They mined one large cut at the site of Mr. Chapil's former workings, and began work at a second site just above the mouth of McKay Gulch. Old underground workings were found at the second site. Bedrock there was badly decomposed.

Klondike Mining (104)
Bonanza Creek 115 O 14
1979, 1980 (Klondike)
63° 55'N, 139° 14'W

This property is situated on upper Bonanza Creek, at its confluence with O'Neil Gulch. A thick layer of black muck blankets the section. Bedrock is fissile, contorted chlorite schist.

Klondike Mining began work on the property in 1979. Equipment used was a D7 and a D8 bulldozer, and a 225 backhoe. A 210 metre (700 feet) long section along the left limit of Bonanza Creek above O'Neil Gulch was stripped, and a cut from the section was mined. The section is between the limit of dredging, and the valley wall. The left limit of O'Neil Gulch was also stripped. Mining continued at the site in 1980. A D7 and two D8H bulldozers and a 945B loader were used by 6 employees.

L. Beyer (105)
Kolody Enterprises 115 O 14
Bonanza Creek (Klondike)
1979, 1980, 1981 63° 55'N, 139° 15'W

This property is located along Bonanza Creek, approximately 450 metres (1,500 feet) upstream from the mouth of Nigger Jim Gulch. Deposits in the centre of the valley consist of tailings from old dredge mining operations. Previously unmined gravel is present along the valley walls.

L. Beyer worked alone at this location in 1979 and 1980. He mined dredge tailings along the left limit of the creek by hand. Kolody Enterprises mined a large cut during 1981.

Klondike Mining (106)
Bonanza Creek 115 O 14
1980 (Klondike)
63° 55'N, 139° 15'W

This property is situated on Bonanza Creek, downstream from the mouth of O'Neil Gulch. Deposits consist of old dredge tailings in the centre of the valley, and previously unmined deposits along the margins of the tailings. A thick layer of black muck blankets the gravel along the margins of the tailings. Bedrock is fissile contorted chlorite schist.

Work in 1980 was done 300 metres (1,000 feet) downstream from the mouth of O'Neil Gulch along the right limit. A D7 bulldozer, two D8H bulldozers, and a 945B loader were used by 6 employees. One D8H bulldozer was used to mine the gravel, and the loader transported it to a stockpile at the sluice box. The second D8H pushed the gravel into the box, while the D7 moved tailings away. A "Ross" sluice box and a "Rock" sluice box were used, sometimes with one set up immediately below the other in an attempt to increase gold recovery.

Mac-Bry Mines (107)
Bonanza Creek 115 O 14
Gauvin Gulch (Klondike)
1978, 1979, 1980 63° 55'N, 139° 16'W
1981, 1982

This property includes Gauvin Gulch, and the portion of upper Bonanza Creek just upstream and downstream from the mouth of Gauvin Gulch. Deposits on the property vary, and include slide rock from the valley walls, hydraulic tailings from former operations on Bunker Hill, dredge tailings, black muck, and undisturbed gravel. Bedrock is slabby-weathering quartz-sericite schist.

Work done during 1978 was in a deep cut in Gauvin Gulch, approximately 150 metres (500 feet) from its mouth. The cut was expanded to 90 metres (300 feet) square, and 18 metres (60 feet) deep. Water for sluicing was pumped from Bonanza Creek. Tailings were stacked along the sides of the cut. The center of the cut was left open, to provide a pit into which the thick deposits of black muck present on claims farther up Gauvin Gulch can be stripped at some future time. Bulldozers were used for some work, but most work was done with a 980 loader. During 1979, work continued on Gauvin Gulch. A cut 120 metres (400 feet) long, 45 metres (150 feet) wide and 21 metres (70 feet) deep was mined upstream from the 1978 workings. A second cut was mined in 1979 on Bonanza Creek, just downstream from the mouth of Gauvin Gulch. It totalled 200 metres (650 feet) wide, 105 metres (350 feet) long, and 12 metres (40 feet) deep. Two D8 bulldozers, a 980 loader, and a 931 backhoe-loader were used. Work was done in 1980 by 11 employees working on two shifts. They used one D8K bulldozer, two 980C loaders, and a 931 backhoe-loader to mine an area of 1907-1916 vintage dredge tailings 155 metres (510 feet) long, 85 metres (275 feet) wide and 12 metres (40 feet) deep from the centre of Bonanza Creek. A "Ross" sluice box was used to process the material. Water for sluicing was obtained from a reservoir on Bonanza Creek constructed in 1979. Some water was recirculated, as the flow of Bonanza Creek was not sufficient. In 1981, 6 employees worked on two shifts with a D9K bulldozers, a 980C loader, and a 931 backhoe-loader. They mined an area of dredge tailings and previously unworked gravel along the right limit of Bonanza Creek at the mouth of Gauvin Gulch. A single channel sluice box was used to process the material mined. Work in 1982 was done on Gauvin Gulch. Two employees used a 931 loader, and a single channel sluice box 1.2 metres (4 feet) wide, and 8.5 metres (28 feet) long. Black muck 2.5 to 3 metres (8 to 10 feet) thick was ground sluiced away from a gravel deposit 2.5 to 5 metres (8 to 16 feet) deep by gravity-fed water. The section is not frozen.

Gold recovered from Gauvin Gulch is slightly coarser grained than that recovered from Bonanza Creek. It is reported to have a fineness of 660 to 675, while gold from Bonanza Creek is reported to have a fineness of 790 to 820.

W. Hinnek (108)
F. Berger 115 O 14
Bonanza Creek (Klondike)
1980, 1981, 1982 63° 55'N, 139° 18'W

This property is situated on upper Bonanza Creek, just above its confluence with Eldorado Creek. Deposits being mined are narrow strips along the right and left limits between dredge tailings and the valley walls. A section along the right limit consisted of 1.5 to 4.5 metres (5 to 15 feet) of layered colluvium with organic-rich and silty to earthy matrix and angular bedrock fragments overlying 1.5 metres (5 feet) of black muck with abundant organic detritus and 1.2 metres (4 feet) of gravel with sandy matrix. The deposit is frozen. Mr. Hinnek believes the dredge was prevented from mining the area along the right limit by a rib of ice occupying old underground workings which runs along the margin of the dredge tailings.

Work was begun on the left limit of the creek in 1980 with a D7 and a D8 bulldozer, and a drag-line with 1.5 cubic metre (2 cubic yard) bucket. A cut 120 metres (400 feet) long and 25 metres (80 feet) wide was stripped, and a bedrock drain was dug. Work continued at the left limit cut during 1981. In 1982, Mr. Hinnek worked alone. He mined a cut along the right limit 30 metres (100 feet) long and 15 metres (50 feet) wide to a depth of 4.5 metres (15 feet). A 17A (D7) bulldozer, dragline, and backhoe with .4 cubic metre (.5 cubic yard) bucket were used.

Gold recovered from the cut along the left limit is coarser grained than gold recovered from the cut along the right limit, and appears to be of two types having different finenesses. Gold recovered from the cut along the right limit is fine grained, flat, and has a worn appearance.

K. Daunt (109)
Bonanza Creek 115 O 4
Skookum Gulch (Klondike)
1978, 1979, 1980 63° 55'N, 139° 20'W
1981, 1982

This location is on Skookum Gulch at its confluence with Bonanza Creek. Deposits in one section on the left limit of Skookum Gulch, and about 12 metres (40 feet) above the present level of the creek consisted of 4.5 metres (15 feet) of gravel with parallel stratification. Some layers contain worn flat boulders, while others contain angular pieces of locally-derived chlorite schist. A 1.5 metre (5 feet) thick layer of clayey and silty material grading to colluvium overlies the gravel.

Work on the property in 1978 and 1979 was done on a very limited scale. It included stripping and other preparatory work. In 1980, a dam was built on Skookum Gulch to provide water for sluicing. A small cut approximately 350 square metres (3,750 square feet) in area was mined from the left limit of Skookum Gulch. A D2 bulldozer was used. The D2 bulldozer, a D7 bulldozer, and a JCB 30 backhoe-loader were used in 1981 to enlarge the cut. Three people worked at the site in 1982, using a D8H bulldozer and a JCB 30 backhoe-loader. A single channel sluice box was used to process the gravel. A box tender operated a monitor directing water against the gravel to wash it through the box, and manually pushed large blocks of bedrock and large boulders through the box. Water for sluicing was pumped from Bonanza Creek.

Gold recovered at this site appears to be from three distinct sources. Dark gold, often with associated quartz has a fineness of 600. It is thought to have come from Skookum Gulch. Bright gold with a fineness of 760 is thought to have been reworked from "White Channel" gravel deposits cut by Skookum Gulch. Limited amounts of whitish crystalline gold of unknown fineness are also found. It may also have been reworked from "White Channel" gravel deposits.

Bonanza Creek (110)
Little Skookum Gulch 115 O 14
J. Waiste (Klondike)
1978, 1979 63° 56'N, 139° 21'W
1980, 1981

This property is situated on Little Skookum Gulch, a small left limit tributary of Bonanza Creek between Adams Creek and Skookum Gulch. The area mined lies immediately north of, and just below the elevation of Cheechako Hill. Deposits of "White Channel" gravel occur on Cheechako Hill. Deposits in Little Skookum Gulch include tailings from old hand mining operations, tailings from hydraulic mining operations on Cheechako Hill, black muck, and brown gravel with a sandy matrix. Bedrock is sericite schist and biotite schist. The bedrock surface is very irregular.

Work done on the property in 1978 was in preparation for mining. An access road was built, and an area of approximately 3,500 square metres (37,500 square feet) was stripped. A cut 9 metres (30 feet) wide and 60 metres (200 feet) long was mined to a depth of 3 to 4.5 metres (10 to 15 feet) in 1979. Water for sluicing was pumped from Bonanza Creek. During 1980, one cut of 3,500 square metres (37,500 square feet) was mined to a depth of 1.2 metres (4 feet). A second cut 45 metres (150 feet) square and 2.5 metres (8 feet) deep was also mined. A D5 bulldozer and a 920 loader were used by three people to do the 1980 work. A D5 bulldozer, a 920 loader, and a 988 loader were used by Mr. Waiste and one helper to mine a small cut in 1981. They mined for only one month. No work was done on the property in 1982.

Gold recovered from Little Skookum Gulch has one of two characteristic habits. Some of it is flat and worn, while some is rough and commonly is intergrown with quartz. These two types of gold appear to have different origins. A small amount of crystalline gold has been recovered from this locality. One remarkable nugget was flat, approximately 2.5 cm (1 inch) across, and had a worn appearance. Two octahedral gold crystals 2 mm (1/12 inch) across were attached to the nugget. Another nugget 1 cm (3/8 inch) across was completely in a castellated crystalline form.

King Solomon Mines (111)
A. Fry 115 O 14
D. Fry (Klondike)
Bonanza Creek 63° 56'N, 139° 21'W
1980, 1981, 1982

Deposits mined at this locality, which is on the left limit of Bonanza Creek just upstream from Adams Creek, were remnants of early operations which worked "White Channel" gravel on Cheechako Hill. The material mined during 1980, 1981, and 1982 included remnants of gravel, and bedrock from the Cheechako Hill bench, and some

tailings from old hydraulic workings on the bench. Bedrock is blocky-weathering quartz-sericite schist.

During 1980, a limited amount of work was done on Cheechako Hill with a D8 bulldozer and a 980 loader after work had finished at King Solomon Mines' Gold Hill property on Eldorado Creek. A D4T cable bulldozer, a D8 bulldozer, and a 980 loader were used in 1981 to mine .5 metres (2 feet) of bedrock from the north part of Cheechako Hill. The same equipment plus a D9H bulldozer was used by 6 people working 2 shifts to mine a similar thickness of bedrock from the south end of Cheechako Hill. The area mined during 1981 and 1982 was approximately 185,000 square metres (2,000,000 square feet). The material mined was sluiced in a single channel metal sluice box. Mining at the property was completed in 1982. Trees on Magnet, Hill were logged, in preparation for 1983 work there.

Gold recovered from this property is rough textured. Some is intergrown with white quartz grains. Some smaller grains are badly stained by iron and manganese oxides.

G. Caley (112)
Adams Creek 115 O 14
1978, 1979 (Klondike)
1980, 1982 63° 55'N, 139° 22'W

Deposits from the center of the creek valley, and from a low left limit bench have been mined at this locality. The section consists of 6 to 6.5 metres (20 to 25 feet) of black muck and silt overlying 1.5 metres (5 feet) of coarse gravel. Bedrock is highly fissile graphitic schist. Well laminated grit deposits occupying the center of Adams Creek valley at the lower end of the Caley property are tailings from hydraulic mining operations on Cheechako Hill. Parts of the property have been previously mined by hand. Tailings from drag-line or shovel mining operations occupy the center of the valley.

Mining was done at this site in 1978, 1979, 1980, and 1982. In 1978, a D7E bulldozer and a 950 loader were used to mine three cuts totalling 3,900 square metres (42,000 square feet) in area. Three cuts totalling 3,000 square metres (32,250 square feet) were mined in 1979. The D7E bulldozer and 950 loader were again used. Work was done by Mr. Caley, with one employee during times of sluicing. During 1980, and 1981, Mr. Caley mined on other properties on Adams and Eldorado Creeks. He also mined two cuts totalling 975 square metres (10,500 square feet) in area from the property during 1980. In 1982, he returned to the property and mined a cut of 700 square metres (7,500 square feet) from along the left limit. A D7E bulldozer, and 950 loader were used along with a 9 metre (30 foot) long metal sluice box.

Mr. Caley notes that the grain size of gold recovered from the upper reaches of Adams Creek is coarser than that of gold recovered from the lower reaches of the creek.

H. Yoder (113)
Adams Creek 115 O 14
1978, 1979, 1980, (Klondike)
1981, 1982 63° 55'N, 139° 23'W

Deposits being mined at this locality are discontinuous pockets of gravel overlain by slide rock along the right limitof the creek, and a 4.5 metre (15 feet) thick section of gravel in the valley bottom. The gravel is matrix supported, and has a sandy matrix and sub-angular to subround cobbles and boulders. The gravel occurs in lenses approximately 1 metre (3 feet) thick. Organic-rich silt occurs erratically throughout the section, and at its top. Bedrock is contorted chloritic schist.

Mining was done at this site each year between 1978 and 1982. In 1978, a small 3444 International backhoe/loader with 0.4 cubic metre (0.5 cubic yard) loader bucket was used to mine a few hundred cubic metres (yards) of gravel. A small cut was mined with the same equipment in 1979, and some stripping was done. Work in both years was along the right limit. In 1980, a 920 bulldozer was used to prepare gravel in the center of the valley for sluicing. The gravel was washed away by a flood. The 920 bulldozer was used again in 1981 to mine a small cut. In 1982, Mr. Yoder used the 3444 International backhoe/loader and the 920 bulldozer to mine along the left limit in the valley bottom. A reservoir above the workings provided water for sluicing. The water was gravity fed.

Gold recovered from this site on Adams Creek is reported to have a fineness of 750.

W. Weigand (114)
Adams Creek 115 O 14
1979, 1980 (Klondike)
63° 55'N, 139° 23'W

The section at this locality consists of 6.5 to 7 metres (25 to 30 feet) of black muck and silt overlying 1.5 to 2 metres (5 to 6.5 feet) of gravel. The deposit is situated on a low left limit bench in the narrow valley.

Work in preparation for mining was done at this site in 1979 when some overburden was stripped. In 1980, the remainder of the overburden was stripped and the underlying gravel was mined and sluiced. Between 0.8 and 1.2 metres (2.5 and 4 feet) of bedrock were also mined and sluiced. A D8K and a D7E bulldozer, and a 950 loader were used. Work was done in two locations and totalled 3,050 square metres (33,000 square feet) in area. Water for sluicing was obtained from a reservoir above the workings. Mr. G. Caley and two employees were operators at the site for Mr. Weigand.

K. Sigurdson (115)
Northwest Consolidated 115 O 14
Industries Ltd. (Klondike)
Bonanza Creek 63° 56'N, 139° 19'W
1979, 1980

This property is situated on the right limit of Bonanza Creek opposite the mouth of Adams Creek. The deposits were on a low level bench on the downstream side of a spur of resistant bedrock, and extended from approximately 6 to 25 metres (20 to 80 feet) upslope from the present creek level. They consisted of a thin layer 1.2 to 2.5 metres (4 to 8 feet) thick of matrix supported brown silty gravel with approximately 50% clasts (by volume), and minor discontinous interstratified layers of black muck.

Bedrock is quartz-sericite schist.

K. Sigurdson did three week's work on the property during 1979. In 1980, Northwest Consolidated Industries Ltd. operated on the property with three employees using a D8H bulldozer and a Hein-Werner backhoe with .7 cubic metre (7/8 cubic yard) bucket. Gravel was pushed to a stockpile by the bulldozer. The backhoe was used to feed the sluice box. The sluice box consisted of two single channel sections. All material mined was fed through the upper section. A box tender had to force slabs of bedrock along the box manually. Fine grained material passed through a grizzly at the end of the first section, and was processed through the second section. The deposit was "mined out" during the 1980 season. The area mined was approximately 2,500 square metres (27,000 square feet).

Hawk Mining Co. (116)
Bonanza Creek 115 O 14
Fox Gulch (Klondike)
1978, 1979 63° 57'N, 139° 21'W
1981, 1982

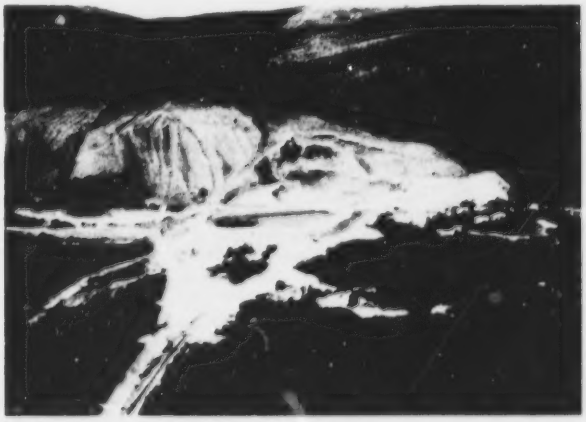
This property is situated on Bonanza Creek at the mouth of Fox Gulch. Deposits mined here in 1978, 1979, 1981, and 1982 were gravel from a low level bench along the right limit of Bonanza Creek, gravel and tailings from Oro Fino and Monte Cristo Hills, two high level left limit benches where "White Channel" gravel was mined by hydraulic methods, and gravel and bedrock from Fox Gulch.

Cut along Fox Gulch mined by Hawk Mining Co. in 1982. Tailings from hydraulic mining on Oro Fino and Monte Cristo Hills cover Fox Gulch gravel, which is in part stained by dark iron and manganese oxides.

During 1978 and 1979, stripping was done on a low level right limit bench along Bonanza Creek opposite Fox Gulch. No work was done in 1980. Two people using a D8K bulldozer and a 950 loader worked on the property in 1981. They mined tailings from old hydraulic workings on Oro Fino Hill as well as remnants of previously unworked White Channel gravel from Oro Fino Hill. The material was pushed into a stockpile in Fox Gulch by bulldozer and then transported across the Bonanza Creek road and fed into the sluice box by loader. Water for sluicing was pumped from Bonanza Creek. Tailings were impounded in old dredge tailings along the left limit of Bonanza Creek. Three people worked with a D8K bulldozer and 950 loader on the property in 1982. They mined a shallow cut approximately 60 metres (200 feet) square from the edge of Monte Cristo Hill at the beginning of the season. They later mined a layer approximately 4.5 to 6 metres (15 to 20 feet) thick of old hydraulic tailings which had been washed into Fox Gulch from Oro Fino and Monte Cristo Hills. Below the old tailings, a cut 18 metres (60 feet) wide, 60 metres (200 feet) long and 9 metres (30 feet) deep was dug into colluvium, sandy gravel with iron and manganese staining, and blocky-weathering quartz augen gneiss bedrock. Several old shafts were encountered. Mining and processing procedure in 1982 was as in 1981.

Cadillac Exploration Ltd. (117)
Bonanza Creek 115 O 14
1981 (Klondike)
63° 57'N, 139° 22'W

Deposits at this location, which is on a high bench along the left limit of Bonanza Creek at the north end of Monte Cristo Hill, are of "White Channel" gravel. The section consists of 4 metres (13 feet) of clast-supported limonite-stained gravel overlying 12 metres (40 feet) of clast-supported white gravel. Bedrock is blocky-weathering, resistant contorted chlorite schist. Neither the gravel nor the bedrock is decomposed. Piles of large quartz boulders stacked on Bunker Hill are remnants of early mining operations.



View of Cadillac Exploration Ltd. property on Monte Cristo Hill. The cut mined in 1981 is directly behind the water reservoir.

Cadillac Explorations worked on this property during 1981. They used two D8 bulldozers, and a 988 loader. The upper part of the "White Channel" gravel section was stripped by bulldozer. The material removed was pushed north to the end of Monte Cristo Hill, and into Monte Cristo Gulch. The lower part of the section was processed by a vibrating screening plant which removed all material coarser than 2 cm (3/4 inch) in diameter, and fed material finer than that to a single channel sluice box. Water for sluicing was pumped to the bench from Bonanza Creek and

stored in a reservoir 1,500 square metres (16,000 square feet) in area and 2.5 metres (8 feet) deep. Tailings were deposited over the side of the bench into Monte Cristo Gulch.

High Gravity Resouces Ltd. (118)
Boulder Creek 115 O 14
1982 (Klondike)
63° 57'N, 139° 26'W

This property is situated near the headwaters of Boulder Creek, a left limit tributary of Bonanza Creek. A poorly exposed section at this site consists of 2 metres (6 feet) of interbedded black muck with large tree fragments and colluvium with large angular slabs of locally-derived chlorite schist overlying 2 to 2.5 metres (6 to 8 feet) of matrix supported sandy gravel with 20% clasts. The deposits are frozen.

Work was begun in 1982. Four to five employees working with a Komatsu D155A bulldozer, a Case K680 backhoe-loader, and a Terex 72-41 loader constructed an access road, built a small reservoir on Boulder Creek to impound water for sluicing, and dug a bedrock drain along the right limit of the creek. A cut approximately 15 metres (50 feet) wide, 90 metres (300 feet) long and 2 metres (6 feet) deep was mined and processed through a single channel sluice box.

R. Troberg (119)
Bonanza Creek 115 O 14
1981, 1982 (Klondike)
63° 58'N, 139° 22'W

This property is situated along the left limit of Bonanza Creek just below its confluence with Boulder Creek. It occupies a broad embayment in the Bonanza Creek valley wall between Boulder and 49 Hills. The section being mined is along a low bench 4 metres (14 feet) above the present creek level, between old dredge tailings and the valley wall. The deposits are discontinous, and of variable thickness. One section consists of 2 metres (6 feet) of earthy colluvium overlying .3 metres (1 foot) of fine sand and sand gravel, and 1.5 metres (5 feet) of coarse, clast supported gravel with round boulders and well developed depositional structures. Another section has up to 5 metres (16 feet) of colluvium overlying sandy gravel. Bedrock is blocky weathering quartz-muscovite schist.

During 1981, a JD 644B loader was used to mine an area approximately 90 metres (300 feet) long and 30 metres (100 feet) wide to a depth of 3 to 4 metes (10 to 13 feet). Bedrock was mined to a depth of 1 metre (3 feet). Clear water filtered through dredge tailings along Bonanza Creek was used for sluicing. Mr. Troberg and two employees used the JD 644B loader in 1982 to mine an area similar in size to the 1981 workings, and downstream from them.

D. Edwards (120)
Bonanza Creek 115 O 14
49 Gulch (Klondike)
1982 63° 58'N, 139° 22'W

Deposits being mined at this locality lie along the right limit of 49 Gulch at its confluence with Bonanza Creek. The bank on the south side of the workings along 49 Gulch rises steeply. Deposits exposed in the cut include a number of types of material, possibly reflecting deposition at different times by both Bonanza Creek and 49 Gulch. Up to 4.5 metres (15 feet) of poorly sorted gravel with coarse angular to sub-angular clasts, and sandy and organic-rich lenses overlie a thin, discontinuous layer of well sorted gravel with sub-round clasts. The bedrock surface is irregular. From 0 to 2.5 metres (0 to 8 feet) of colluvium overlie the section.

A cut approximately 40 metres (125 feet) long, 20 metres (75 feet wide), and averaging 4.5 metres (15 feet) deep was mined at this site in 1982. One to three metres (3 to 10 feet) of bedrock were taken. A 977L tracked loader and a 235 backhoe were used for the work. The material was processed in a small, single channel sluice box.

K.M.A. Mines (121)
Klondike Mining Company 115 O 14
Bonanza Creek (Klondike)
1978, 1979, 1980 63° 59'N, 139° 21'W
1981, 1982

This property is situated on the right limit of Bonanza Creek, just downstream from Fortynine Gulch. Deposits being mined are along the right limit at, and slightly above creek level. They lie between the dredged area and the valley wall. The area is known locally as "Harry Leamon Gulch" in honour of the miner who did much underground work at the property in past years. Deposits present include black muck, gravel, and colluvium. Bedrock is quartz-sericite schist. Some bedrock blocky weathering and resistant, while some is badly decomposed.

Work by K.M.A. Mines was begun in 1978. A D8 bulldozer and a backhoe were used to mine a cut 23 metres (75 feet) wide, 46 metres (150 feet) long, and up to 9 metres (30 feet) deep. The cut was enlarged in 1979. The same equipment was used to mine an area 30 metres (100 feet) long and 90 metres (300 feet) wide. Nine metres (30 feet) of black muck were stripped and 3 metres (10 feet) of gravel and bedrock were mined and sluiced. Drainage in the cut was a severe problem as the bottom of the cut was below the level of Bonanza Creek. Water seeping through the dredge tailings filled the pit faster than it could be pumped. Much work was therefore done by the backhoe which reached down into the water-filled pit to mine. In 1980, Klondike Mining Company mined at this site. They used an International 3984 backhoe with longer reach than the one used by K.M.A. Mines to deepen and enlarge the cut. K.M.A. Mines began work at a second cut approximately 150 metres (500 feet) south of their original cut in 1980. Using a D8 bulldozer, and an International backhoe with .75 cubic metre (1 cubic yard) bucket, they stripped 45 metres (150 feet) wide and 135 metres (450 feet) long, and mined and processed an additional 4.5 metres (15 feet) of material from the cut. A single channel sluice with two sections was used. All material was washed through the first section of the sluice. Only the fined-grained fraction of the material was washed through the second section of the sluice. K.M.A. Mines continued work at the new cut in 1981 with the D8

bulldozer and backhoe. The cut was against the valley wall, and above the level of Bonanza Creek. Drainage problems were not encountered. A section in the 1981 consisted of 4 metres (13 feet) of mixed black muck and gravel with blocky, angular clasts overlying 3 metres (10 feet) of gravel with locally derived blocky clasts, 2 metres (6 feet) of black muck with sand lenses, and 0 to 1 metres (0 to 3 feet) of matrix supported sandy gravel with round clasts. The bedrock surface was highly irregular. Four employees working two shifts hydraulicked away the black muck, and then mined the gravel and several feet of bedrock. Material was passed over a shaking screening plant. Only material less then 3 cm (1.25 inches) in diameter was sluiced. Capacity of the screening plant was 38 cubic metres (50 cubic yards) per hour. In 1982, K.M.A. Mines continued work at their 1981 cut. Four people worked with a D8H bulldozer and backhoe. Bedrock in the cut was found to rise a shallow steps, defining a series of low benches.

Gold from this property is pellet-like in shape, dull in colour, and appears worn. Most is fine-grained. Its fineness is reported to be 780.

Unknown (122)
Bonanza Creek 115 O 14
1981 (Klondike)
63° 59'N, 139° 21'W

This property is situated on a bench along the right limit of Bonanza Creek and some 40 metres (130 feet) above it. Deposits on the bench were likely less than one metre (3 feet) thick, and consisted of colluvium rather than gravel. The entire area available had been mined, and the operators had left at the time the property was visited.

Work was done on the property during 1981. A D4 and a D6 bulldozer were used to mine a shallow cut approximately 40 metres (125 feet) wide, 55 metres (175 feet) long, and one metre (3 feet) deep from the downstream side of a high bedrock spur of quartz augen gneiss. A long, narrow, single channel sluice box was also used.

K & K Mining (123)
Bonanza Creek 115 O 14
1980, 1981, 1982 (Klondike)
63° 59'N, 139° 22'W

This property is situated on Bonanza Creek, upstream from Pure Gold and Sourdough Gulches. Deposits mined were on low level benches on both the right and left limits of Bonanza Creek. One section exposed in the cut on the left limit bench in 1982 consisted of 6 to 7.2 metres (20 to 25 feet) of well banded colluvium with up to 20% angular bedrock fragments and some organic detritus overlying 1.5 metres (5 feet) of laminated silt, and 3 to 6 metres (10 to 20 feet) of matrix supported sandy gravel with round clasts. The clasts were commonly more than 25 cm (10 inches) in diameter, and increased in size toward bedrock. Bedrock is quartz augen gneiss.

Work was begun on the property in 1980 on a low level right limit bench approximately 1,000 metres (3,300 feet) upstream from Pure Gold Gulch. Four people mined, using a D7 and a TD20 bulldozer, and two loaders with .75 and 1.5 cubic metre (1 and 2 cubic yard) buckets. Slide rock from the valley wall covered a thin section of black muck and brown earthy gravel. Equipment was moved 200 metres (660 feet) downstream to a low level left limit bench part way through the 1980 mining season. A narrow cut was mined along the edge of old workings at this site. A single channel metal sluice box was used for sluicing. Work continued at the site on the left limit of Bonanza Creek in 1981. Six people worked 2 shifts with a D9G bulldozer and a Fiat-Allis 645B loader. A grizzly with 15 cm (6 inch) spacing was used to separate very coarse material from finer material prior to sluicing. Tailings were deposited in old dredge tailings. Four people worked at the property with a D9G bulldozer and a 980B loader in 1982. Colluvium overlying the gravel was stripped by hydraulicking. The gravel was ripped up and stock piled by bulldozer. The loader was used to feed the sluice box and remove tailings. Late in the season, a "Derocker" classification system was put into operation to remove all material coarser than 5 cm (2 inches) prior to sluicing. It eliminated the need for a box tender.

C. Nicholson (124)
Bonanza Creek 115 O 14
1981, 1982 (Klondike)
64° 00'N, 139° 21'W

This property is situated on a high level right limit bench of Bonanza Creek just downstream from Pure Gold Gulch. The bench is slightly higher than the one at Sourdough Hill, which lies just across Bonanza Creek. Deposits at Sourdough Hill are of "White Channel" gravel. Deposits at this property are, however, of brown gravel and silt. A 4.5 metre (15 feet) thick horizon of matrix supported gravel with silty to earthy matrix and only 15% clasts overlies a 1.5 metre (5 feet) thick layer of interlaminated silt, clay, and sand, and a 2 metre (6 feet) thick horizon of clast supported gravel with sandy to gritty matrix. Bedrock is chlorite schist. It is not decomposed.

Mr. Nicholson began work on this property during 1981. His work was mostly in preparation for 1982 mining activities. In 1982, he worked with a D9G bulldozer to mine and push gravel to a stockpile, and a 920 loader to feed the sluice box. A dry grizzly above the box removed all clasts larger than 20 cm (8 inches) in diameter from the material to be sluiced.

S. Berg (125)
C. Nicholson 115 O 14
Bonanza Creek (Klondike)
1979, 1980 64° 00'N, 139° 22'W
1981, 1982

Deposits at this site, which is on a high level left limit bench of Bonanza Creek, are of "White Channel" gravel. The thickness of the section varies, as the deposits are present as a wedge which thins toward the edge of the bench. One 12 metre (40 feet) thick section consisted of one metre (3 feet) of white gravels underlain by 1.5 metres (5 feet) of reddish gravels underlain by 9.5 metres (32 feet) of white to grey gravel. All the gravel is clast supported with sub-round quartz, schist, and augen gneiss clasts. Sandy horizons are present. Bedrock is highly sheared and contorted micaceous schist. It is ferruginous in part.

View of C. Nicholson cut on Sourdough Hill, along the left limit of Bonanza Creek. Tailings at the foot of the hill have been levelled.

S. Berg worked at this property during 1979. In 1980, C. Nicholson moved to the property, and stripped and mined two cuts of approximately 1,800 square metres (19,500 square feet) each. He used a loader with 2.3 cubic metre (3 cubic yard) bucket, and a single channel sluice box. Water for sluicing was pumped from Bonanza Creek into a storage pond 6,100 square metres (1.5 acres) in area and 1.2 metres (4 feet) deep, and was then gravity fed to the sluice box. Tailings were released over the bank of the bench, and impounded in dredge tailings at the base of Sourdough Hill. Mr. Nicholson continued to mine intermittently at this site during 1981 and 1982.

K. Masters **(126)**
C. Meredith **116 B 3**
Bonanza Creek **(Klondike)**
1980, 1981, 1982 **64° 00'N, 139° 21'W**

This property is situated on the right limit of Bonanza Creek, downstream from Pure Gold Gulch, and beyond the limit of dredging. The narrow gauge railway which ran along Bonanza Creek crossed the property, with the result that it was also not worked by hand.

Work was begun on the property in 1980. A D4 bulldozer was used to strip an area approximately 40 metres (125 feet) wide and 120 metres (400 feet) long of 3 metres (10 feet) of black muck. Several 2 metre (6 feet) deep test pits were dug to bedrock. Deposits under the black muck consist of muddy to sandy organic rich layers with gritty sand and fine gravel beds. Bedrock is blocky weathering sericite schist. Work continued at the property on a limited scale in 1981 and 1982.

Arctic Eldorado Mining Co. **(127)**
Bonanza Creek **116 B 3**
1980, 1981 **(Klondike)**
64° 01'N, 139° 16'W

Deposits at this location, which is on a high bench along the right limit of Bonanza Creek at Cripple Hill are of "White Channel" gravel. The deposits form a wedge thickening away from the edge of the bench. The thickness of the deposits ranges from 0 metres (0 feet) to approximately 40 metres (120 feet). The section consists of 1 metre (3 feet) or less of organic material overlying a sequence of clast supported gravel, with clasts well worn, and generally less than 10 cm (4 inches) in diameter. Quartz and schist clasts are present in equal proportions. Depositional features in the gravel include wispy sand lenses, and low-angle, cross-cutting cross-bedding. They suggest the gravel was deposited in a shallow braided stream environment. Bedrock is highly contorted quartz-sericite schist and carbonaceous schist with vuggy, lensoid quartz veins. Cubic cavities in the quartz veins suggest the former presence of pyrite, which has since been leached from the rock. The carbonaceous schist is decomposed to a depth of more than 5 metres (16 feet) from the gravel-bedrock interface. Rusty iron staining is present in much of the exposed bedrock. Clasts in gravel 1 metre (3 feet) or less above the gravel-bedrock interface were also decomposed.

Work on the property in 1980 was done by 7 employees on two shifts using a D8K bulldozer, and a 988B loader with 5.4 cubic metre (7 cubic yard) bucket capacity. Two areas where work had been done by previous operators at the site were mined. At the east end of the property, 53,500 cubic metres (70,000 cubic yards) of material were mined from an old cut 120 metres (400 feet) square and up to 25 metres (80 feet) deep. At the centre of the property, a second old cut was also enlarged. A three channel "Ross" sluice box capable of handling 230 cubic metres (300 cubic yards) of material per hour was used to process the gravel. Water for sluicing was pumped up 64 metres (210 feet) through a 30 cm (12 inch) pipeline which ran 550 metres (1,800 feet) to Bonanza Creek. All the material mined was sluiced. Tailings were deposited over the side of the bench. Eight employees on two shifts worked at the property during 1981. They used the same equipment as in 1980. Mining was done in one cut facing Bonanza Creek, and in a second at the south end of the property facing Cripple Gulch. Some of the remaining thick section of "White Channel" gravel was stripped, as significant gold values occur almost exclusively within a few metres (feet) of bedrock in the deposits.

P. Foth **(128)**
Trail Gulch **116 B 3**
1979, 1980 **(Klondike)**
1981, 1982 **64° 01'N, 139° 21'W**

This property is situated on Trail Gulch, a small right limit tributary of Bonanza Creek near its mouth. Trail Gulch lies between Cripple and Trail Hills. It has cut through the deposits of "White Channel" gravel on those hills. A thick layer of black muck covers gravel deposits in the gulch.

Mr. Foth mined the property on a small scale in 1979, 1980, 1981 and 1982. Black muck was hydraulicked away each spring and fall when water was available. Other work was done with a small JD bulldozer.

B. Abel (129)
Bonanza Creek 116 B 3
1979 (Klondike)
64° 01'N, 139° 23'W

This property is situated on a left limit bench along Bonanza Creek, opposite Trail Hill.

Mr. Abel mined at this location during 1979. He had left the site at the time it was visited.

C. Nicholson (130)
Bonanza Creek 116 B 3
1978 (Klondike)
64° 01'N, 139° 21'W

Deposits at this locality, which is on a high level right limit bench of Bonanza Creek named Trail Hill, consist of a 12 metre (40 feet) thick sequence of "White Channel" gravel.

Mr. Nicholson worked on Trail Hill in 1978 using a D9 bulldozer and a 920 loader. He encountered difficulties including slumping of the face of the cut.

Sigma Properties Ltd. (131)
Bonanza Creek 116 B 3
1982 (Klondike)
64° 01'N, 139° 21'W

This property is located along the right limit of Bonanza Creek, at the mouth of Lovett Gulch. Deposits present include a wedge 0 to 25 metres (0 to 80 feet) thick of quartz-rich tailings from hydraulic mining operations on Lovett Hill, overlying 2 to 4 metres (6.5 to 13 feet) of ice-rich black muck, and 3 to 5 feet (10 to 16 feet) of matrix-supported sandy gravel. This area was being mined by hand when the dredge passed along the left limit of Bonanza Creek. It was not dredged at that time, and was later covered by the hydraulic tailings so it was also not mined by bulldozer.

Mining at the Sigma Properties operation in 1982. A thick layer of quartz-rich tailings from hydraulic mining operations on Lovett Hill, and black muck have been stripped. Gravel is being loaded into the truck for transport to the sluice box.

Sigma Properties Ltd. began mining at this location in 1982, after drill testing confirmed the presence of gold-bearing gravel beneath the tailings from Lovett Hill. Work was done on two shifts, using two D9H bulldozers, one 992B loader, two 637 scraper-loaders with 23.7 cubic metre (31 cubic yard) capacity, and four off-road dump trucks. The Bonanza Creek road was diverted, a drain was dug, and tailings and black muck were stripped from a large cut. Gravel was mined, and processed through a vibrating screening unit and sluice box. Work was begun on a second cut near the end of the mining season.

C. Nicholson (132)
Bonanza Creek 116 B 3
1979 (Klondike)
64° 01'N, 139° 21'W

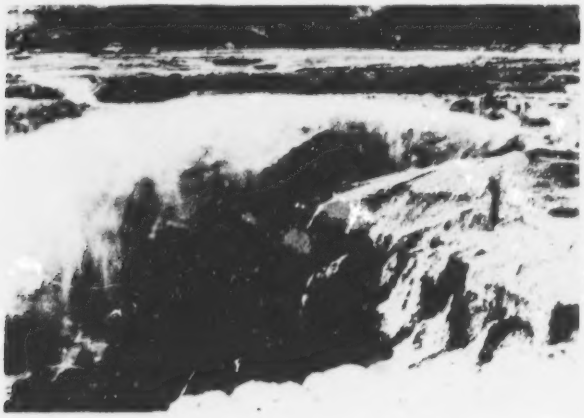
This property is situated on Lovett Hill, a high level right limit bench of Bonanza Creek near its mouth. Deposits are of "White Channel" gravel. The gravel is indurated, and stands as stable cliffs. Previous workers at this site have mined a large cut with amphitheatre-like form, and walls up to 30 metres (100 feet) high. Bedrock is partially decomposed chlorite schist.

Mr. Nicholson mined using a D9 bulldozer in 1979, in an area where the gravel was 18 metres (60 feet) thick. He stripped the upper 5/6 of the section, and mined and sluiced the lower 1/6 along with .5 metres (2 feet) of bedrock. One cut of 30 metres (200 feet) square and 14 metres (45 feet) deep was made. In a second cut, 0.5 metres (2 feet) of bedrock was mined from an area 60 metres (200 feet) square. Water for sluicing was pumped through 60 vertical metres (200 feet) from Bonanza Creek and stored in a reservoir. It was pumped a further 15 vertical metres (50 feet) for sluicing. Water from sluicing was returned to the reservoir for recirculation.

Norwest Placer Operators Ltd. (133)
Universal Explorations Ltd. 116 B 3
Klondike River (Klondike)
1980, 1981, 1982 64° 02'N, 139° 21'W

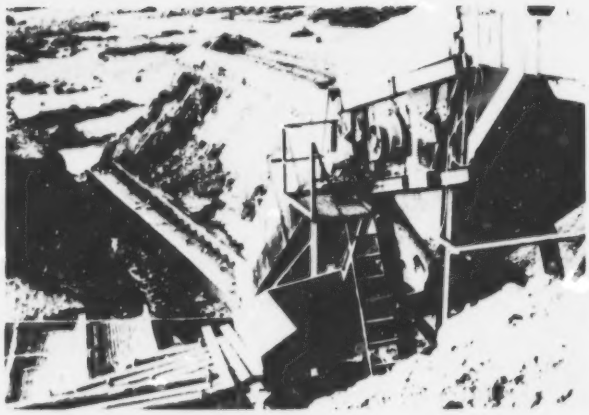
This property is located on Jackson Hill, a left limit bench of Klondike River approximately 90 metres (300 feet) above the present elevation of the river. Deposits present consist of 53 metres (175 feet) of Klondike gravel overlying 42.5 metres (140 feet) of White Channel gravel. The Klondike Gravel is brown, clast-supported sandy gravel with most clasts approximately 5 cm (2 inches) in diameter. Clasts are of quartz, carbonaceous shale, chert, and schist. There are ice wedges up to 10 metres (33 feet) long in the gravel. The Klondike gravel is a glaciofluvial outwash deposit. Channels at the base of the Klondike gravel crosscut the underlying White Channel gravel. The White Channel gravel is clast-supported, and has a sericitic matrix. Most clasts are approximately 7.5 cm (3 inches) in diameter, although clasts up to 75 cm (30 inches) in diameter do occur. Clasts are of quartz, sericitic schist, and occasionally granodiorite. The schist and granodiorite clasts are slightly to badly decomposed, even near the top of the White Channel gravel section. Bedrock is quartz-sericite schist with minor quartz veins and lenses. It is badly decomposed to at least 1.2 metres (4 feet) below the

bedrock surface. There have previously been hydraulic mining operations on Jackson Hill.



Hydraulicking at the Universal Explorations Ltd. property on Jackson Hill during 1980. Water was used to strip a thick section of Klondike gravel from the underlying White Channel gravel. Tailings from former dredge mining operations along Klondike River are in the background.

Work on Jackson Hill in 1980 was done by Norwest Placer Operators Ltd. on behalf of Universal Explorations Ltd. Water was pumped from a diversion of Klondike River by an 860 hp twelve cylinder diesel pump, with a maximum lift of 180 metres (590 feet) and boosted to the top of Jackson Hill by a 350 hp six cylinder diesel pump with a maximum lift of 71.5 metres (235 feet). Water directed by two monitors was used to strip approximately 45 metres (150 feet) of Klondike gravel from a cut of 8,350 square metres (90,000 square feet). It was then used to mine White Channel gravel, and to wash it to and through the sluice boxes. The gravel passed first over a long sluice box 1.2 metres (4 feet) wide and then into a vibrating screening unit. Grains less than 1.2 cm (.5 inches) in diameter were divided between eight sluice boxes 1.2 metres (4 feet) wide, and 6.1 metres (20 feet) long. Material sluiced in these boxes was collected by a 90 cm (3 feet) wide sluice box 12.2 metres (40 feet) long running across the foot of the eight sluice boxes, and transported to a long sluice box 1.2 metres (4 feet) wide where it joined the oversized material from the screening unit and was washed over the edge of Jackson Hill to a tailings pile. Nine people worked on two shifts at this location in 1980. Universal Explorations Ltd. took over the operation in 1981. Fifteen people worked on two shifts using two D8K bulldozers, one 824 wheeled bulldozer, one John Deere 401C backhoe, and water directed by two monitors. Approximately 642,200 cubic metres (840,000 cubic yards) of gravel were mined from a cut of 6,850 square metres (73,800 square feet) in area, and 90 metres (300 feet) deep. Most of the material mined was sluiced. Of the gold recovered, 83% came from 18 metres (60 feet) or less above bedrock, and 96% came from 3.5 metres (12 feet) or less above bedrock. Universal Explorations Ltd. continued work in 1982. Ten people worked using one D8K bulldozer, one 984C wheeled bulldozer, and water directed by one monitor to mine a cut 6,350 square metres (68,400 square feet) in area and 18 metres (60 feet) deep which was stripped in 1981, and to do test work to the east along Jackson Hill.



Vibrating screening unit, sluice boxes, and tail race at Jackson Hill. The pipes leading from the bottom of the screening unit carry undersized grains to the eight sluice boxes. The floors of the sluice boxes are covered by expanded metal and cocoa matting.

Wheeled bulldozer pushing gravel into a stockpile. Loader transports the gravel to the sluice box.

Westwardlands Ltd. **(134)**
Klondike River **116 B 3**
1981, 1982 **(Klondike)**
64° 03'N, 139° 26'W

This property is situated on a low bench along the left limit of Klondike River at its confluence with Yukon River. The bench is known now as Lousetown Bench, although when early bulldozer mining operations were active there it was known as Groetschier Bench. Deposits present consist of 1.8 to 2.7 metres (6 to 9 feet) of brown sandy gravel.

Work was begun in 1981 by Westwardlands Ltd. Two people worked using one D8H bulldozer and one 966C loader to mine. The material mined was processed through a three channel "Ross-200" sluice box. Water for sluicing

was pumped from Klondike River, and recirculated from the lower of two settling ponds on the bench. Work continued in 1982, when the same equipment was used to mine. Gravel was fed over a grizzly, from which undersize went by conveyor to a trommel. Undersize from the trommel was sluiced.

Gold from this site is reported to have a fineness of 842.

View of the Westwardlands Ltd. property on the bench at the confluence of the Klondike and Yukon Rivers. The Yukon River is in the background.

G. Crawford (135)
Arctic Rim Operators 116 B 3
218171 B.C. Co. Ltd. (Klondike)
Bear Creek 64° 01'N, 139° 14'W
1979, 1980, 1981

This property lies in a narrow, steep sided section of the Bear Creek Valley, just above the upper limit of old dredge workings. The section consists of approximately .5 metres (2 feet) of slide rock from the valley walls overlying 5 to 6.5 metres (16 to 22 feet) of layered black muck and gravel. Bedrock is well foliated, blocky weathering quartz-sericite-chlorite schist. It is not decomposed. Many cobbles in the gravel section are blocky, and appear to be of local derivation.

G. Crawford worked at this site in 1979. Arctic Rim Operators took over the property in 1980. Nine employees worked on two shifts using a D8 bulldozer, a 980C loader, and a 627 scraper-loader. They mined a cut 215 metres (700 feet) long and 55 metres (180 feet) wide. The deposits were 5 to 5.5 metres (17 to 18 feet) deep. Half a metre (2 feet) of badly broken bedrock was also mined. The sluice box used to process the gravel was a three channel "Rock" box, with two 1.2 by 6 metre (4 by 20 feet) side channels for processing fine-grained material straddling a 1 by 12 metre (3 by 40 feet) centre channel for processing coarse material. 218171 B.C. Co. Ltd. worked at the site in 1981. Seven employees on two shifts used a D8K bulldozer, two 980C loaders and a 627 scraper-loader to mine a cut 460 metres (1,500 feet) long, 30 metres (100 feet) wide and 7.5 metres (24 feet) deep.

Mining at Arctic Rim Operators property along Bear Creek. Scraper-loaders were used to work in the long, narrow cuts at this site.

Gold recovered from this site is reported and to have a fineness of 690 to 700. Crystals of gold 1.5 mm (1.16 inch) in diameter and less have been recovered in small numbers from this site.

D. Johnson (136)
Goldfield Canada 116 B 3
Bear Creek (Klondike)
1978, 1979 64° 00'N, 139° 14'W
1980, 1981

This property lies at the mouth of Discovery Pup, in a narrow, steep sided section of the Bear Creek Valley. The section consists of approximately .5 metres (2 feet) of slide rock from the valley walls overlying up to 12 metres (40 feet) of layered black muck and gravel the thickness of the layers varies, but black muck and gravel each comprise about half of the total. The gravel is closely packed, with sub-round pebbles and sandy matrix. The total thickness of the section varies according to how far from the valley walls it lies. The deposits are frozen. Bedrock consists of block-fractured quartz-sericite schist without decomposition features.

D. Johnson worked at this site during 1978, using a D8 bulldozer and a 988 loader. Much stripping and some sluicing was done. Work continued during 1979. Goldfield Canada took over the property in 1980. Nine employees worked on two shifts, using two D8K bulldozers, two 980C loaders, and a 988 loader. They mined along the left limit margin of the 1979 workings in deposits 11 metres (36 feet) deep. A three channel sluice box was used. The side runs, in which the finer grained fraction of the gravel was processed, were set at a more shallow slope than was the centre run. Seven people worked on two shifts at the site using a D8K bulldozer, a 980C and a 988 loader, and a 627 scraper-loader during 1981. They mined an area of some 24,500 square metres (264,000 square feet) containing 187,000 cubic metres (245,000 cubic yards) of material, but sluiced only the lower 1.2 metres (4 feet) of the 7.5 metre (25 feet) thick section. A "Derocker" classification system was used to remove all clasts coarser than 5 cm (2 inches). Material finer than 1.6 cm (5/8 inch) was then processed in

one channel of a two channel sluice box, while material between 1.6 on 5 cm (5/8 and 2 inches) was processed in the other.

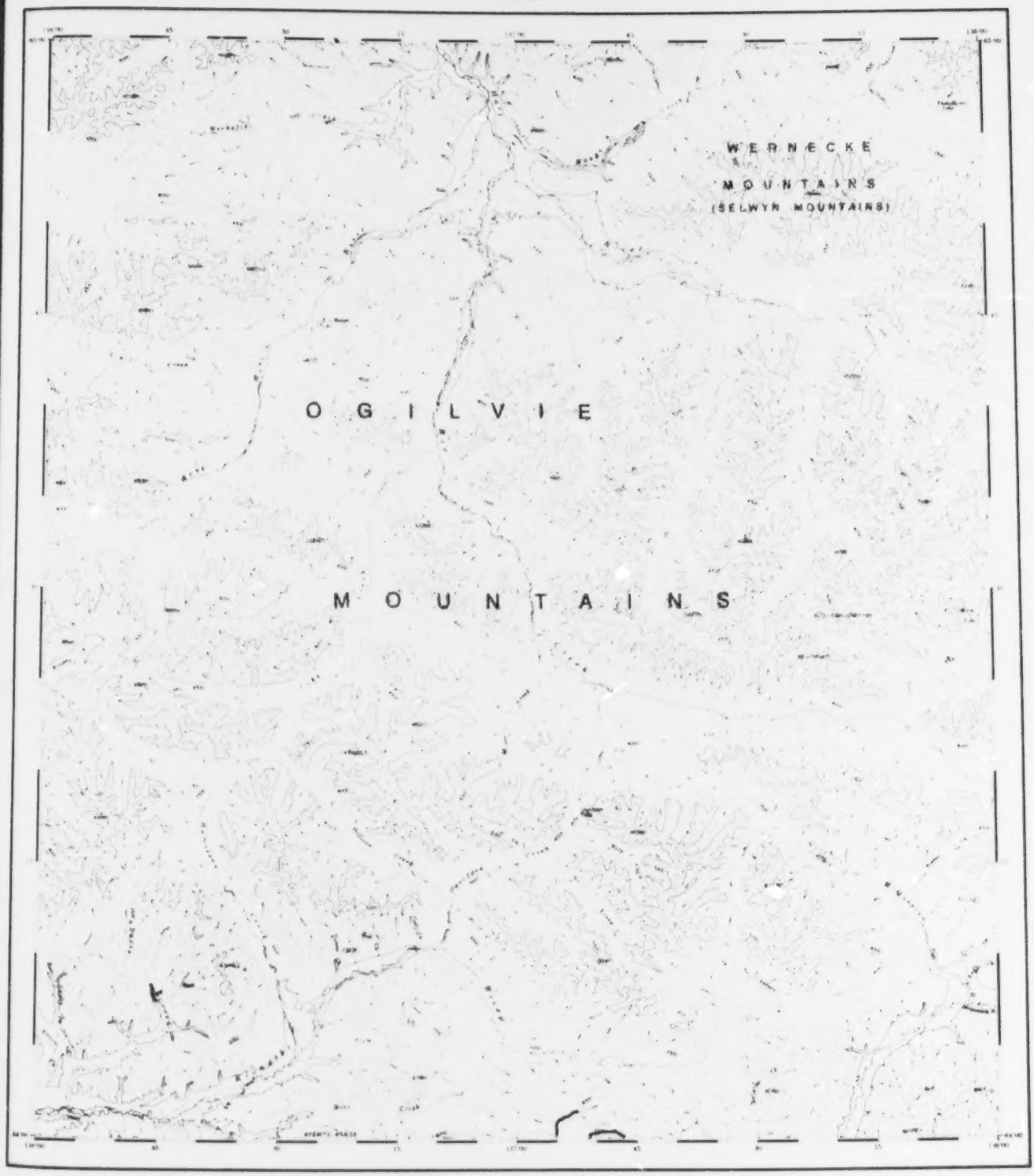
A small lode gold prospect is situated on the left limit of the creek below this operation.

Bear Creek Ventures **(137)**
Bear Creek **115 O 14**
1982 **(Klondike)**
63° 58'N, 139° 13'W

This property is situated on the upper reaches of Bear Creek, just below its confluence with Lindow Creek. The creek valley widens at that point from the narrow, steep-sided valley present along the lower reaches of the creek. The deposits at the site are frozen, and average 6 metres (20 feet) in depth.

During 1982, 10 employees worked two shifts using a D8H and a D8K bulldozer to strip and stockpile gravel, and two 980C loaders to feed the sluice box and remove tailings. A "Derocker" classification system was used to remove material coarser than 5 cm (2 inches) prior to sluicing.

116A



HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983.

LARSEN CREEK
YUKON TERRITORY

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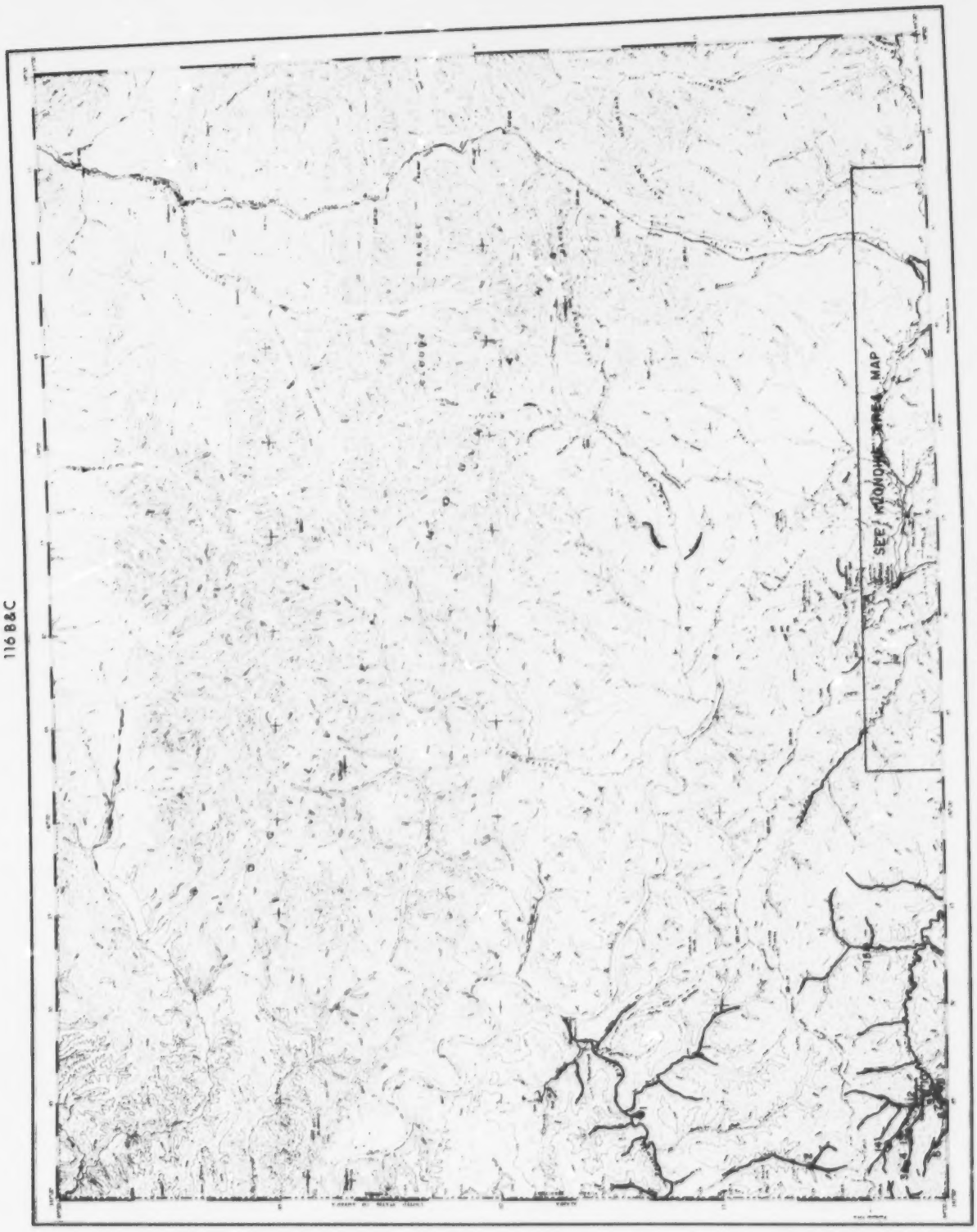
KILOMETRES


116 B&C
SEE KLONDIKE AREA MAP
DAWSON
YUKON TERRITORY
HEAVY LINES INDICATE PLACER CLAIMS AND LEASES IN GOOD STANDING AS OF JANUARY 1, 1983
DOTS SHOW PLACER MINING OPERATIONS ACTIVE DURING THE PERIOD 1978 TO 1982. NUMBERS BESIDE THE DOTS RELATE TO THE TEXT

PLACER MINING OPERATIONS IN THE DAWSON MAP AREA, NTS 116 B/C

Sikanni Oilfield Construction Ltd. (1)
Fortymile River 116 C 7
1982 64°21'N, 140° 48'W

This property is situated along the left limit of Fortymile River, in the area enclosed by the large meander just downstream from the mouth of Marten Creek. Deposits at this location are up to 5.5 metres (18 feet) deep.

Test work including trenching and drilling were done at this location prior to 1982. Mining was begun in 1982, when 16 to 20 people worked using a D6C bulldozer, a D8H bulldozer, a 930 loader with 2.3 cubic metre (3 cubic yard) bucket and a 225 backhoe with .75 cubic metre (1 cubic yard) bucket. The large bulldozer was used to mine and push gravel to the sluice box, while the small bulldozer pushed the gravel into the box. Tailings were removed by the loader. The backhoe was used for testing. Water for sluicing was recirculated from a settling pond, although "make-up" water was taken from Fortymile River.

Gold from Fortymile River is reported to have a fineness of 814 to 820.

J. Malfair (2)
Moose Creek 116 C 2
1981, 1982 64° 09'N, 140° 55'W

This property is situated along the upper portion of Moose Creek at the mouths of right and left limit tributaries. There is evidence of previous mining operations at this location.

Three people mined part-time at this property in 1981 and 1982.

Gold from Moose Creek is reported to have a fineness of 855.

M. Olsson (3)
Glacier Creek 116 C 2
1982 64° 02'N, 140° 55'W

This property is located along the headwaters of Glacier Creek. Deposits are from 1.2 to 1.5 metres (4 to 5 feet) deep. The gold-bearing portion of the deposits is approximately 4.6 metres (15 feet) wide.

M. Olsson mined at this site in 1982, using a rubber tired backhoe-front end loader.

D. Spriggs (4)
Glacier Creek 116 C 2
1982 64° 03'N, 140° 55'W

This property is situated along the headwaters of Glacier Creek, immediately downstream from the mining operation of M. Olsson. The deposits are frozen at this location.

Work was done in 1982 by two people using a D8K bulldozer. Some stripping was done, although most of the work was testing.

Capital Dynamics (5)
Miller Creek 116 C 2
1982 64° 01'N, 140° 52'W

This property is situated along the middle portion of Miller Creek, approximately 5.9 km (3.7 miles) upstream from its confluence with Sixty Mile River. Deposits being mined consist of well-washed gravel overlain by blue-grey silt and black muck in the present valley of Miller Creek. Also present are a 15 metre (50 feet) thick succession of gravel in an old channel along the left limit of the creek, and tailings from old hydraulic workings on the broad bedrock rib separating the present and old channels. Cinnibar is not recovered from the deposits at this site, although it is recovered from deposits downstream along Miller Creek.

Work at this location was done by nine people working on two shifts in 1982. Stripping was done at night. Three D8 bulldozers were used to mine a cut from 15 to 30 metres (50 to 100 feet) wide and approximately 335 metres (1,100 feet) in length along the present creek and some low, left limit terraces.

Gold from Miller Creek is reported to have a fineness of 827 to 857.

M. Connors (6)
C. McDougall 116 C 2
Sixty Mile River 64° 00'N, 140° 44'W
1981, 1982

This property is located along the left limit of Sixty Mile River, approximately 2.4 km (1.5 miles) downstream from the mouth of Miller Creek. It is the site of the yard at the former R.C.M.P. post in the area, and as such, was left untouched when Sixty Mile River was dredged. Deposits are 2.4 metres (8 feet) thick, and consist of clast-supported sandy gravel. Most clasts are 7.5 cm (3 inches) in diameter or smaller, although some boulders up to 20 cm (8 inches) in diameter are present.

Work at this property was done by M. Connors, C. McDougall, and one helper in 1981, and by M. Connors and two helpers in 1982. They worked with two D8H bulldozers, and mined a total of approximately 11,500 cubic metres (15,000 cubic yards) of material. A three-channel metal sluice box was used to process the gravel.

In addition to gold, fresh pyrite grains, well worn hematite grains, and very well worn garnet grains each up to 1 cm (.4 inches) in diameter were recovered in the sluice box. Gold from Sixty Mile River is reported to have a fineness of 810.

L. Haner (7)
Sixty Mile River 116 C 2
1979, 1980, 64° 00'N, 140° 45'W
1981, 1982

This property is located along a left limit bench of Sixty Mile River, approximately 2.9 km (1.8 miles) downstream from the mouth of Miller Creek. Deposits are up to 18 metres (60 feet) thick, and consist of up to 12 metres (40 feet) of black muck and gravel overlying 1.2 to 1.8 metres (4 to 6 feet) of featureless gravel, 1.8 metres (6 feet) of cross laminated silt and organic debris, and 1.8 to 2.4 metres of clast supported gravel. The upper black muck and gravel unit contains numerous discontinuous silt and gravel lenses, and gravel horizons up to .9 metres (3 feet) thick in black muck with organic debris including branches. The lower gravel unit has a layer of coarse boulders at its base, and a gradational contact with the overlying silt unit. Bedrock is andesite with fine grained feldspar phenocrysts. It is decomposed in some places, but not decomposed in others.

Work at this property was begun late in 1979, when a D7 bulldozer and 90 cm (36 inches) wide sluice box 9 metres (30 feet) long were used to mine and process gravel. Three people worked using the same equipment in 1980. In addition to mining, they built a 30 metre (100 feet) dike to impound sluicing water in old tailings. Work continued in 1981, when five people used a D7 bulldozer, a D9C bulldozer, a 966C loader, and an Insley H-3500 backhoe to mine. Gravel was processed in a "Ross 200" three-channel sluice box. Water for sluicing was pumped from the Miller Creek Ditch. Four people mined using the same equipment along with a single-channel sluice box in 1982. Water for sluicing was seepage water pumped from a large reservoir in dredge tailings. Two large cuts 45 metres (150 feet) wide, and 150 and 275 metres (500 and 900 feet) long respectively were mined between 1979 and 1982.

M. Connors (8)
C. McDougall 116 C 2
Sixty Mile River 64° 00'N, 140° 46'W
1979

This property is situated along the left limit bench of Sixty Mile River, approximately 2.7 km (1.7 miles) downstream from the mouth of Miller Creek. Deposits consist of up to 12 metres (40 feet) of organic- and ice-rich black muck overlying up to 2.4 metres (8 feet) of gravel. Bedrock is andesite. In some places the collapse of old underground workings where all the gravel was mined has caused black muck to rest directly on bedrock.

M. Connors and C. McDougall worked at this property in 1979. The black muck was stripped, and the underlying gravel was mined and sluiced.

C. McDougall (9)
Sixty Mile River 116 C 2
1982 64° 00'N, 140° 44'W

This property is located along the left limit bench of Sixty Mile River, approximately 1.3 km (.8 miles) upstream from the mouth of Big Gold Creek.

Hydraulicking to strip black muck from the C. McDougall property along the left limit bench of Sixty Mile River.

Work at this site began in 1982. C. McDougall used a D7 bulldozer, and water under pressure to strip ice-rich black muck from a cut approximately 50 metres (500 feet) long.

Cogasa Mining Corp. (10)
B.E.L. Yukon Establishment 116 C 2
Sixty Mile River 64° 01'N, 140° 43'W
1978, 1979, 1980
1981, 1982

This property is situated along the Sixty Mile River, just upstream from the mouth of Big Gold Creek, and near the centre of the historically famous Sixty Mile placer mining area in which the first discoveries were made in 1892. Hand mining was the earliest type of mining done in the area. Dredging followed. The first dredge was built by North American Trading and Transportation Company. It worked on Miller Creek in 1915 and 1916. The dredge was later refitted by Holbrook Dredging Company, and operated in the valley of Sixty Mile River between 1929 and 1941. The second dredge was built by Yukon Explorations Limited. It worked on Big Gold Creek, downstream from the mouth of Glacier Creek, and on Sixty Mile River between 1947 and 1959. A number of individuals and companies have done bulldozer mining on the creeks in the area since the late 1940's. Recorded production for the Sixty Mile goldfield is approximately 7,185,000 grams (231,000 ounces) of fine gold, of which half was produced prior to 1917.

The Sixty Mile River valley is broad, and flat. Deposits at the Cogasa Mining Corp. property include old dredge tailings, and undistrubed deposits consisting of .6 to 1.2 metres (2 to 4 feet) of muck overlying 2.4 to 3.4 metres (8 to 11 feet) of clast supported silty gravel with large scale cross-bedding and channel structures. Bedrock is partially decomposed andesite.

Work on the property was begun by Cogasa Mining Corp. in 1975. Between 1975 and 1977, mining was done using traditional bulldozer and sluice box methods. Work continued in 1978, but unconventional mining and

processing methods were introduced. The company had five D9 bulldozers, nine 641 scraper loaders, each with a capacity of 26.8 cubic metres (35 cubic yards), three TD-25C bulldozers, and two front end loaders, although not all pieces of equipment were in use at any one time. Material was mined using the scraper-loaders, and hauled to a grizzly. Oversized material was sent to tailings by way of a conveyor belt, and second scraper-loader. Undersized material was sent to a vibrating screening unit by conveyor. From the screening unit, oversized material was sent to tailings by yet another conveyor, and the second scraper loader. Undersized material was split into a fraction from 3.5 to 35 mm (.14 to 1.4 inches) in size, which was sluiced, and a fraction less than 3.5 mm (.14 inches) in size, which was processed in hydrocyclones and long toms. Vibrating and stationary sluices were used to process the portion of the material which was sluiced. The recovery rates of the two types of sluice boxes were similar, but the vibrating sluice box was able to process significantly more material than the stationary one. Work at the property continued in 1979. Thirty-five people mined using two D9 bulldozers, four 641 scraper-loaders, and a 16 grader. The processing unit included ninety-six individual vibrating sluices. Operating problems prohibited the processing unit from reaching its designed capacity of 450 to 535 cubic metres (600 to 700 cubic yards) of material per hour. Twenty-five people continued mining in 1980, using eight bulldozers, most of which were D9 models, nine 641 scraper-loaders, a 225 backhoe, 2 loaders, and a grader. Modifications were made to the processing unit. The conveyor belt system was removed, as it was apparent it was not economical, and a triple deck screening unit and double tiered sluices were installed. The modified unit had a design capacity of 380 cubic metres (500 cubic yards) per hour, but only 73,860 cubic metres (96,610 cubic yards) of material were processed during the 1980 season. Gold recovery in 1980 was approximately 77,750 grams (2,500 ounces). Costs incurred in developing and modifying the processing unit from 1978 to 1980 totalled $4,000,000. Twelve people worked on two shifts in 1981, using three D9 bulldozers and a 225 backhoe. Material was mined by bulldozer, and fed to a conveyor with the backhoe. The conveyor transported the gravel to a vibrating screening unit, from which any material finer than 2.5 cm (1 inch) in diameter was split between seven sluice boxes. In 1982, twelve people continued work on two shifts using two D9H bulldozers, two 941 scraper-loaders, one 225 backhoe, and the same processing unit as in 1981 during most of the season. Near the end of the 1982 season, a series of seven vibrating sluices were substituted for the stationary ones previously in use.

Gold recovered from Sixty Mile River is reported to have a fineness of 810. The grain size and abundance of gold at this location is reported to increase as bedrock is aproached. Magnetite, garnet, and pyrite are also recovered at this location.

Fellhawk Placers (11)
Sixty Mile River 116 C 2
Big Gold Creek 64° 01'N, 140° 44'W
1978, 1979, 1980
1981, 1982

This property is situated along the left limit of Sixty Mile River, and the right limit of Big Gold Creek, at and near their confluence. Deposits along both streams have been mined between 1978 and 1982. Deposits along Sixty Mile River lie on a bench 1.8 to 2.4 metres (6 to 8 feet) above the present level of the river and consist of 1.2 metres (4 feet) of black muck overlying 4.9 to 6 metres (16 to 20 feet) of gravel. Only the lowermost 1 to 2 metres (3 to 6.5 feet) of gravel is sluiced. The overlying gravel and black muck is stripped. Deposits along Big Gold Creek also lie on a bench above the present level of the creek. They consist of 3 metres (10 feet) of black muck overlying 3.7 metres (12 feet) of gravel with silty matrix, and schist clasts. Bedrock is decomposed andesite and andesite breccia. The decomposition extends 1.2 metres (4 feet) down from the bedrock-gravel interface.

Mining was done on the Sixty Mile River bench in 1978. Two people worked using one D7 and one D8 bulldozer. Work continued at that location in 1979. Water for sluicing was obtained from a reservoir on Glacier Creek. Activites were transferred to Big Gold Creek in 1980. Stripping and a limited amount of mining and sluicing were done. Work continued on Big Gold Creek in 1981. One D7E bulldozer, two D8 bulldozers, and a D9H bulldozer were used. Stripping, mining, and sluicing were done. A single channel sluice box 90 cm (3 feet) wide and 9 metres (30 feet) long was used. A bedrock drain 245 metres (800 feet) long leading to the settling ponds was dug. Two people continued work at this location in 1982, using one D7E bulldozer, and D8 bulldozer, and one D9H bulldozer.

Gold from Big Gold Creek is reported to have a fineness of 847 to 854.

Glacier Creek Placers (12)
Glacier Creek 116 C 2
1978, 1979, 1980 64° 02'N, 140° 46'W

This property is situated on a left limit bench along Glacier Creek, immediately upstream from its confluence with Big Gold Creek. The bench is approximately 6 metres (20 feet) above the present creek level. Deposits consist of a repetitive sequence of seven or more poorly defined and poorly sorted clast-supported gravel units .9 to 1.5 metres (3 to 5 feet) thick each, separated by discontinuous silt horizons up to .6 metres (2 feet) thick. The total sequence is 9.1 metres (30 feet) thick. Most clasts in the gravel are less than 15 cm (6 inches) in diameter. Most are schist, although some andesite clasts are present. The andesite clasts are decomposed to at least 6 metres (20 feet) above bedrock. The andesite porphyry bedrock is also decomposed. Imbrications, and poorly developed cross-laminations present in the gravel indicate that the stream which laid down these deposits was flowing southward. The deposits were thus probably deposited by Big Gold Creek at a time its channel was farther west than at present. Only the bottom 2 metres (6.5 feet) of the section were sluiced. This is evidence of old workings in the areas.

L. Guimard and E. Faucher mined at this site in 1978 using two D6 bulldozers. A D8 bulldozer was also used part time. They mined two cuts, each 22.9 metres (75 feet) wide and 30 metres (100 feet) long. Water for sluicing was obtained from Glacier Creek, but the supply of water was not adequate. Work was done in 1976 and 1977 on a ditch to bring water from Big Gold Creek, but the ditch was not used. Mining continued at this location in 1979 and 1980.

Deposits at the Glacier Creek Placers property along a left limit banch of Glacier Creek near its mouth. These deposits are very similar to those along the left limit bench of Miller Creek, and to those along the left limit bench of Sixty Mile River downstream from the mouth of Miller Creek.

Gold from Glacier Creek is reported to have a fineness of 830 to 860.

Glacier Creek Gold Co. (13)
Glacier Creek 116 C 2
1978, 1979, 1980 64° 02'N, 140° 50'W
1981, 1982

This property is located along the middle portion of Glacier Creek. The centre and left limit of the creek were mined during the 1950's by H. Schmidt and G. Franklin, who used bulldozers. Deposits remaining along the right limit of the creek consist of 4.5 to 12 metres (15 to 40 feet) of black muck and silt overlying approximately 1.2 metres (4 feet) of gravel. The black muck and silt are ice-rich, and contain vertical wedges of ice. An old adit has been reported to extend 33.5 metres (110 feet) into unconsolidated deposits along the right limit of the creek.

J. Lynch worked at this property from 1978 to 1982 using two D7 bulldozers. He stripped and mined a cut of approximately 2,500 square metres (27,000 square feet) each year.

Kostem Resources (14)
V. Trainer 116 C 2
Little Gold Creek 64° 04'N, 140° 51'W
1980, 1981, 1982

This property is located along the middle portion of Little Gold Creek, approximately 7 km (4.4 miles) east of the Alaska-Yukon border.

Work at the site began in 1980. Eight employees mined using one D6 bulldozer, one D8 bulldozer, and a 966 loader. In addition to mining, work done included construction of a water resevoir, two settling ponds, and a bedrock drain. Work continued on two shifts in 1981, when one D6 bulldozer, and D8 bulldozer, one 966 loader, one 980C loader, and a Case 580 hoe were used to mine during the day, and a "Ross 300" sluice box was used to process the material at night. Sluicing water was impounded in three settling ponds. V. Trainer continued work on a smaller scale at this location in 1982.

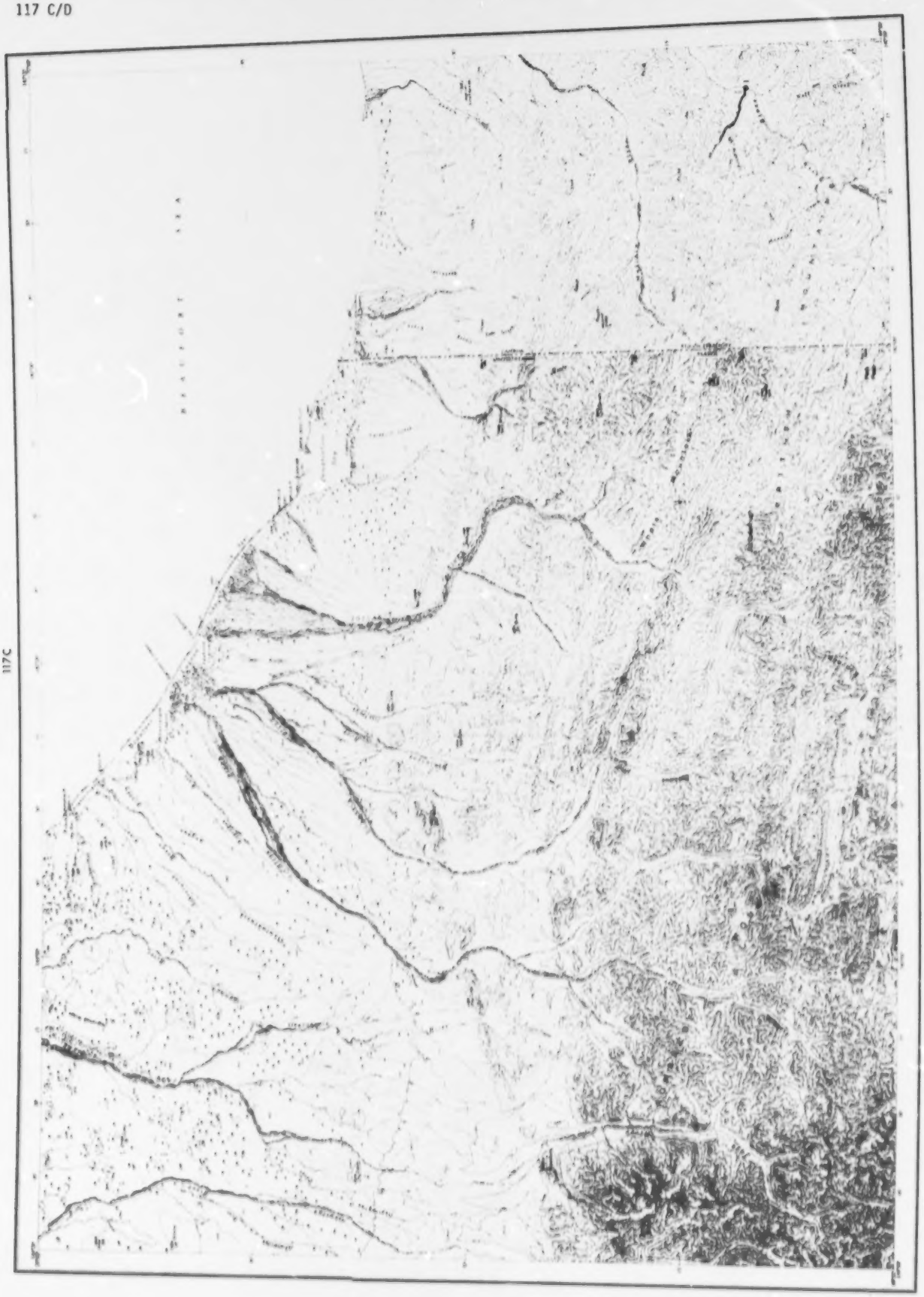
Panterra Resources (15)
2870 Yukon Ltd. 116 C 1
California Creek 64° 05'N, 140° 21'W
1981, 1982

This property is situated on the right limit of the middle reaches of California Creek. Deposits at the site consist of .5 to 1.5 metres (2 to 5 feet) of muck overlying 3 metres (10 feet) of gravel.

Mining was begun in 1981. A D7F and a D8 bulldozer, a 922 and a 966C loader, and a "Ram" processing unit with 15 cm (6 inch) grizzly and shaking screens to classify material prior to sluicing, and two narrow sluice boxes 6 and 7.5 metres (20 and 24 feet) long were used. The unit is capable of sluicing 25 cubic metres (33 cubic yards) of material per hour. Work continued in 1982 with a D7F bulldozer, a 922, a 966C, and a 988 loader, and a P & H backhoe with .75 cubic metre (1 cubic yard) bucket. The "Ram" processing unit was again used. Two settling ponds were built.

Drill testing of deposits on California Creek was done in 1982.

NOTES



117C

PLACER MINING OPERATIONS IN THE DEMARCATION POINT MAP AREA, NTS 117 C/D

R. Parkes (1)
Sheep Creek 117 C 1
1978, 1979, 1980 69° 10'N, 140° 09'W
1981, 1982

This property is located along the lower portion of Sheep Creek, approximately .6 km (.4 miles) upstream from its confluence with Firth River. It is approximately 33 km (20.8 miles) east of the Alaska-Yukon border, and 49 km (30.5 miles) south of the Arctic Ocean. Deposits consist of .6 metres (2 feet) of muck overlying 1.8 metres (6 feet) of gravel. They are frozen.

Work at this site began in 1973, although placer gold was reported in the Firth River and its tributaries by the first explorers to reach the area. In 1978, 1979, and 1980, a 950 loader was used for stripping and mining. The gravel was washed in a 60 cm (2 feet) wide sluice box, using gravity-fed water. Approximately 9,175 cubic metres (12,000 cubic yards) of gravel were sluiced annually. A D7 bulldozer was used along with the 950 loader in 1981 and 1982. Two people worked each year.

In addition to gold, well worn magnetite is recovered from the deposits at this location.

REFERENCES TO PLACER CREEKS IN YUKON

Compiled by R.L. Debicki, 1983

The following lists are of references to published information concerning creeks in Yukon on which there was placer activity during recent years. They include references to Geological Survey of Canada reports published between 1863 and 1968, Department of Indian Affairs and Northern Development publications covering 1941 to 1959, and 1969 to 1977, and British Columbia Department of Mines reports published between 1874 and 1979. Additional references to creeks not listed here, or to individual deposits may be found by searching the general indices to Geological Survey of Canada and British Columbia Department of Mines publications, and the indices of individual publications for which general indices are not available.

The lists of references include a number of standard abbreviations for agency and report names. They are:

Ann. Rept.	Annual Report
B.C.D.M.	British Columbia Department of Mines
Bull.	Geological Bulletin
D.I.A.N.D.	Department of Indian Affairs and Northern Development
Econ. Geol.	Economic Geology Series
G.S.C.	Geological Survey of Canada
Geo. Expln. Min.	Geology, Exploration, and Mining
Mem.	Memoir
Paper	Paper
Pub.	Separate Report, Publication No.
Sum. Rept.	Summary Report
Yukon Min. Ind.	Yukon Mineral Industry

Adams Gulch

	Page No.
G.S.C. Sum. Rept. XII	26A, 31A
	44R, 45R
G.S.C. Sum. Rept. XIII	64R
G.S.C. Sum. Rept. XIV	36B, 39B
	60B, 67B
G.S.C. Sum. Rept. XV	433A
G.S.C. Pub. 979	8, 17, 19, 20
D.I.A.N.D. Yukon Min. Ind. 1941-1959	71, 81
	89, 90, 95, 96, 103
	110, 116, 122, 129, 134
G.S.C. Paper 63-38	46
G.S.C. Paper 66-31	95
G.S.C. Paper 68-68	95, 96
G.S.C. Paper 69-55	56
D.I.A.N.D. Yukon Min. Ind. 1969-1970	148
D.I.A.N.D. Yukon Min. Ind. 1976	230
D.I.A.N.D. Yukon Min. Ind. 1977	103

Allgold Creek

	Page No.
G.S.C. Sum. Rept. XI	56A
G.S.C. Sum. Rept. XII	51A
G.S.C. Sum. Rept. XIV	7B, 40B, 46B
	47B, 68B
G.S.C. Sum. Rept. XV	36AA
G.S.C. Mem. 218	4, 8
G.S.C. Mem. 284	95, 222
D.I.A.N.D. Yukon Min. Ind. 1941-1959	7, 50
	71, 81, 90, 96, 104, 110, 116
G.S.C. Paper 62-27	14
G.S.C. Paper 63-38	56
G.S.C. Paper 64-36	66
G.S.C. Paper 65-19	63
G.S.C. Paper 66-31	103
G.S.C. Paper 67-40	79
G.S.C. Paper 68-68	103
G.S.C. Paper 69-55	60, 61
D.I.A.N.D. Yukon Min. Ind. 1969-1970	147
D.I.A.N.D. Yukon Min. Ind. 1971-1972	131
D.I.A.N.D. Yukon Min. Ind. 1973	131, 132
D.I.A.N.D. Yukon Min. Ind. 1974	172
D.I.A.N.D. Yukon Min. Ind. 1975	181
D.I.A.N.D. Yukon Min. Ind. 1976	226, 227
D.I.A.N.D. Yukon Min. Ind. 1977	101, 104

Anderson Creek

G.S.C. Mem. 193	4
G.S.C. Mem. 220	9
D.I.A.N.D. Yukon Min. Ind. 1941-1959	7

Arch Creek

G.S.C. Sum. Rept. XVI	1A
G.S.C. Sum. Rept. 1906	23-26
G.S.C. Sum. Rept. 1914	24
G.S.C. Mem. 234	18
G.S.C. Mem. 267	24, 41
G.S.C. Mem. 284	149, 150, 360
	369-371
D.I.A.N.D. Yukon Min. Ind. 1941-1959	123, 136
G.S.C. Paper 61-23	18
G.S.C. Paper 62-27	21
D.I.A.N.D. Yukon Min. Ind. 1973	143

Arizona Creek

G.S.C. Paper 48-25	7, 11
G.S.C. Econ. Geol. 17	17, 20

Page No.

Ballarat Creek

G.S.C. Mem. 193 4
G.S.C. Mem. 234 16
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 22
..... 59, 81, 90,96, 104
..... 110, 116, 117, 129, 135
G.S.C. Paper 61-23 ..... 11, 14

Barker Creek

G.S.C. Sum. Rept. 1915 ..... 34, 35
G.S.C. Mem. 97 ..... 1, 3, 10-13
..... 23-27, 34, 35
G.S.C. Mem. 178 3
G.S.C. Mem. 193 4
G.S.C. Mem. 209 4
G.S.C. Mem. 218 8
G.S.C. Mem. 220 10
G.S.C. Mem. 234 16
G.S.C. Mem. 284 409
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 37, 40

Bates Creek

G.S.C. Paper 47-15 ..... 5, 14
G.S.C. Paper 49-24 ..... 8, 29
G.S.C. Mem. 247 96
G.S.C. Mem. 268 ..... 53, 54
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 37
..... 40, 51
G.S.C. Paper 61-23 19
G.S.C. Paper 62-27 22

Bear Creek (Klondike River)

G.S.C. Sum. Rept. XI 56A, 150S
G.S.C. Sum. Rept. XIV 6B, 30B, 46B
G.S.C. Sum. Rept. XV 47A
G.S.C. Pub. 979 ..... 6, 32, 33
G.S.C. Sum. Rept. 1932A II 2
G.S.C. Mem. 193 2
G.S.C. Mem. 209 1
G.S.C. Mem. 284 ..... 95, 236, 350
..... 645, 646
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 19, 20
..... 27, 32, 36, 37, 49, 57
..... 63, 70, 80, 88, 102
G.S.C. Paper 63-38 41
D.I.A.N.D. Yukon Min. Ind. 1973 127
D.I.A.N.D. Yukon Min. Ind. 1974 170
D.I.A.N.D. Yukon Min. Ind. 1976 232

Bear Creek (McQuesten River)

G.S.C. Paper 48-25 ..... 4, 13
G.S.C. Paper 64-36 80
G.S.C. Paper 66-31 117
G.S.C. Paper 67-40 86
G.S.C. Paper 68-68 111

Page No.

Bedrock Creek

G.S.C. Mem. 123 ..... 17, 34, 45, 46
G.S.C. Sum. Rept. 1917-b 7, 9
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 65
..... 71, 117, 123, 129, 135
G.S.C. Paper 61-23 13
D.I.A.N.D. Yukon Min. Ind. 1973 131
D.I.A.N.D. Yukon Min. Ind. 1974 177
D.I.A.N.D. Yukon Min. Ind. 1976 222
D.I.A.N.D. Yukon Min. Ind. 1977 107

Big Creek (Carmacks Area)

G.S.C. Sum. Rept. 1933A II 5
G.S.C. Paper 61-23 20
G.S.C. Paper 65-19 82
D.I.A.N.D. Yukon Min. Ind. 1975 190

Big Gold Creek

G.S.C. Sum. Rept. 1917b 7
G.S.C. Mem. 123 ..... 37, 44, 51
G.S.C. Sum. Rept. 1930A 1
G.S.C. Sum. Rept. 1932A II 4
G.S.C. Sum. Rept. 1933A 1
G.S.C. Mem. 234 ..... 3, 4
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 21
..... 22, 40, 44, 50, 57, 64
..... 70, 80, 88, 95, 103
D.I.A.N.D. Yukon Min. Ind. 1969-1970 150
D.I.A.N.D. Yukon Min. Ind. 1977 105

Black Hills Creek

G.S.C. Mem. 178 2
G.S.C. Mem. 193 3
G.S.C. Mem. 209 ..... 3, 4
G.S.C. Mem. 218 ..... 7, 8
G.S.C. Mem. 220 9
G.S.C. Mem. 234 12
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 8
..... 59, 71, 117
D.I.A.N.D. Yukon Min. Ind. 1975 183
D.I.A.N.D. Yukon Min. Ind. 1976 231
D.I.A.N.D. Yukon Min. Ind. 1977 104

Bonanza Creek

G.S.C. Sum. Rept. X 182S
G.S.C. Sum. Rept. XI 56A-60A
..... 150S, 151S
G.S.C. Sum. Rept. XII 19A, 22A-28A
..... 30A-36A, 16R, 17R, 24R
G.S.C. Sum. Rept. XIII 21A, 169A
G.S.C. Sum. Rept. XIV 22A, 6B, 17B, 24B
..... 30B, 32B-40B, 49B
..... 58B, 64B, 66B, 68B, 69B
G.S.C. Sum. Rept. XV 35AA, 37AA, 39AA
G.S.C. Pub. 979 ..... 9, 14-23, 31, 33

Page No.

G.S.C. Sum. Rept. 1906 21
G.S.C. Sum. Rept. 1909 17
G.S.C. Pub. 1085 128-129
G.S.C. Mem. 74 ..... 53, 164
G.S.C. Econ. Geol. 10 ..... 51, 55
G.S.C. Econ. Geol. 15 30
G.S.C. Map 711A
G.S.C. Mem. 193 ..... 3, 7
G.S.C. Mem. 209 ..... 1, 3
G.S.C. Mem. 218 ..... 3, 5-7
G.S.C. Mem. 220 ..... 4, 5, 7
G.S.C. Mem. 234 ..... 4, 6, 8, 9, 12
G.S.C. Sum. Rept. 1929A 2
G.S.C. Sum. Rept. 1930A 1
G.S.C. Sum. Rept. 1933A 2
G.S.C. Econ. Geol. 7 321
G.S.C. Mem. 284 ..... 85-90, 207, 208, 223
..... 224, 226-230, 235-237, 322
..... 596, 610, 611, 634, 645, 64A
D.I.A.N.D. Yukon Min. Ind. 1941-1959 17-20
..... 26, 27, 32, 33, 36, 43, 49
..... 56, 63, 65, 70-72, 80, 81
..... 88-90, 95, 96, 102-104, 109, 110
..... 115, 116, 121, 122, 128, 129, 134
G.S.C. Paper 61-23 ..... 7, 8, 9, 10
G.S.C. Paper 62-27 ..... 5, 8, 9, 10
G.S.C. Paper 63-38 ..... 41, 44-47
G.S.C. Paper 64-36 56
G.S.C. Paper 65-19 58
G.S.C. Paper 66-31 ..... 91, 93, 94, 96
G.S.C. Paper 67-40 ..... 74, 75
G.S.C. Paper 68-68 91-97
G.S.C. Paper 69-55 ..... 55, 56
D.I.A.N.D. Yukon Min. Ind. 1969-1970 ..... 144, 145
D.I.A.N.D. Yukon Min. Ind. 1971-1972 ..... 129, 130
D.I.A.N.D. Yukon Min. Ind. 1973 128
D.I.A.N.D. Yukon Min. Ind. 1974 ..... 169, 170
D.I.A.N.D. Yukon Min. Ind. 1975 181
D.I.A.N.D. Yukon Min. Ind. 1976 ..... 230, 231
D.I.A.N.D. Yukon Min. Ind. 1977 102

Boucher Creek

G.S.C. Mem. 123 ..... 14, 28, 48
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 37
D.I.A.N.D. Yukon Min. Ind. 1977 105

Bullion Creek

G.S.C. Sum. Rept. XVI 1A, 13A
G.S.C. Sum. Rept. 1906 ..... 24, 25
G.S.C. Sum. Rept. 1914 15-20
G.S.C. Mem. 178 4
G.S.C. Mem. 193 6
G.S.C. Mem. 209 5
G.S.C. Mem. 218 8
G.S.C. Mem. 234 17
G.S.C. Mem. 284 ..... 114, 123, 124, 126
..... 149, 360, 364-366
G.S.C. Paper 53-20 ..... 7, 8
G.S.C. Paper 58-9 ..... 3, 4, 7, 9
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 23
..... 44, 59, 65, 66, 72, 82
..... 111, 117, 130, 136

Page No.

G.S.C. Paper 61-23 ..... 17, 18
G.S.C. Paper 62-27 21
G.S.C. Paper 63-38 ..... 62, 63
G.S.C. Paper 67-40 87
G.S.C. Paper 68-68 113
G.S.C. Paper 69-55 ..... 65, 66
D.I.A.N.D. Yukon Min. Ind. 1969-1970 152
D.I.A.N.D. Yukon Min. Ind. 1971-1972 139

Burwash Creek

G.S.C. Sum. Rept. XVI 1A, 6A-8A, 15A-17A
G.S.C. Sum. Rept. 1906 ..... 24, 26
G.S.C. Sum. Rept. 1914 ..... 15, 22, 23, 32
G.S.C. Sum. Rept. 1918g 12, 13
G.S.C. Mem. 193 6
G.S.C. Econ. Geol. 13 109-111
G.S.C. Mem. 267 ..... 20, 24, 29
..... 30, 34, 40-42
G.S.C. Mem. 284 ..... 114, 123, 125, 147
..... 148, 149, 150, 360
..... 367-369, 377, 461
G.S.C. Paper 58-9 ..... 8, 9
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 23
..... 40, 44, 51, 59
..... 65, 72, 82, 90, 91
..... 97, 105, 111, 117, 123
..... 124, 130, 136
G.S.C. Paper 61-23 ..... 16, 17
G.S.C. Paper 62-27 ..... 20, 21
G.S.C. Paper 63-38 ..... 63, 64
G.S.C. Paper 64-36 82
G.S.C. Paper 65-19 80
G.S.C. Paper 66-31 120
G.S.C. Paper 67-40 86
G.S.C. Paper 68-68 ..... 112, 113
G.S.C. Paper 69-55 65
D.I.A.N.D. Yukon Min. Ind. 1969-1970 146
D.I.A.N.D. Yukon Min. Ind. 1973 143
D.I.A.N.D. Yukon Min. Ind. 1974 184
D.I.A.N.D. Yukon Min. Ind. 1975 188
D.I.A.N.D. Yukon Min. Ind. 1976 238
D.I.A.N.D. Yukon Min. Ind. 1977 108

Calder Creek

G.S.C. Sum. Rept. XIV 54B
D.I.A.N.D. Yukon Min. Ind. 1941-1959 39

California Creek

G.S.C. Sum. Rept. XIV 35A, 36A
G.S.C. Mem. 123 ..... 30, 31, 48
D.I.A.N.D. Yukon Min. Ind. 1941-1959 7
D.I.A.N.D. Yukon Min. Ind. 1977 105

Canadian Creek

G.S.C. Sum. Rept. 1916 ..... 20, 21, 29-31

Page No.

G.S.C. Mem. 123 52
G.S.C. Sum. Rept. 1933A 4
G.S.C. Mem. 178 3
G.S.C. Mem. 193 4
G.S.C. Mem. 209 4
G.S.C. Mem. 218 8
G.S.C. Mem. 234 ..... 1, 27-30
G.S.C. Paper 50-14 15
G.S.C. Econ. Geol. 7 ..... 276, 322
G.S.C. Econ. Geol. 17 ..... 16-19, 30
G.S.C. Mem. 284 ..... 434, 441-445, 647
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 21
..... 59, 65, 71, 81, 90, 111, 117
G.S.C. Paper 61-23 20
G.S.C. Paper 65-19 81
D.I.A.N.D. Yukon Min. Ind. 1976 240

Caribou Creek

G.S.C. Sum. Rept. XII 44A
G.S.C. Sum. Rept. XIV 47B, 51B, 62B
G.S.C. Sum. Rept. 1911 ..... 38, 39
G.S.C. Mem. 284 ..... 3, 7, 344, 610
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 50, 104
..... 110, 135
G.S.C. Paper 63-38 52
G.S.C. Paper 64-36 61
G.S.C. Paper 65-19 61
G.S.C. Paper 66-31 100
G.S.C. Paper 67-40 77
D.I.A.N.D. Yukon Min. Ind. 1977 101

Carlson Creek

G.S.C. Paper 68-68 111

Cascade Creek

G.S.C. Sum. Rept. XVI 31A, 37A
G.S.C. Mem. 193 4
G.S.C. Mem. 284 136
G.S.C. Bull. 32 ..... 26, 28, 30, 34

Clear Creek

G.S.C. Sum. Rept. XIII 40A, 43A
G.S.C. Mem. 193 3
G.S.C. Mem. 209 4
G.S.C. Mem. 218 8
G.S.C. Mem. 220 9
G.S.C. Mem. 234 ..... 12, 13
G.S.C. Paper 45-21 7
G.S.C. Paper 48-25 ..... 2, 6, 8, 11
G.S.C. Paper 50-14 15
G.S.C. Econ. Geol. 17 19
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 21
..... 28, 33, 37, 44, 50, 58, 64, 70
..... 71, 81, 89, 95, 103, 109
..... 115-117, 122, 123, 129, 135

Page No.

G.S.C. Paper 62-27 16
G.S.C. Paper 63-38 57
G.S.C. Paper 64-36 ..... 68, 69
G.S.C. Paper 65-19 65
D.I.A.N.D. Yukon Min. Ind. 1973 137
D.I.A.N.D. Yukon Min. Ind. 1974 180
D.I.A.N.D. Yukon Min. Ind. 1975 185
D.I.A.N.D. Yukon Min. Ind. 1976 236
D.I.A.N.D. Yukon Min. Ind. 1977 98

Cooper Creek

No References

Cottoneva Creek

G.S.C. Sum. Rept. XIV 30A
G.S.C. Sum. Rept. 1907 14
G.S.C. Sum. Rept. 1932A II 6
G.S.C. Mem. 193 4
G.S.C. Mem. 217 26
G.S.C. Mem. 220 10
G.S.C. Mem. 284 ..... 625, 626, 637
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 82
..... 90, 91

Davidson Creek

G.S.C. Mem. 209 4
G.S.C. Mem. 220 ..... 7, 9
D.I.A.N.D. Yukon Min. Ind. 1941-1959 104
G.S.C. Paper 62-27 20
G.S.C. Paper 64-36 80-82

Dawn Creek

No References

Dollis Creek

See Squaw Creek

Dominion Creek

G.S.C. Sum. Rept. X 182S
G.S.C. Sum. Rept. XI 56A, 150S
G.S.C. Sum. Rept. XII 17A, 19A, 21A, 23A
..... 27A, 28A, 41A-44A
G.S.C. Sum. Rept. XIV 6B, 7B, 9B, 13B, 17B
..... 19B, 22B, 32B, 47B-51B, 57B, 67B
G.S.C. Sum. Rept. XV 36AA-39AA
G.S.C. Pub. 979 ..... 9, 34
G.S.C. Sum. Rept. 1906 21
G.S.C. Sum. Rept. 1929A 1
G.S.C. Sum. Rept. 1930A 1

Page No.

G.S.C. Sum. Rept. 1932A II 3
G.S.C. Sum. Rept. 1933A 2, 3
G.S.C. Mem. 178 2
G.S.C. Mem. 193 ..... 2, 3
G.S.C. Mem. 209 ..... 2, 3
G.S.C. Mem. 218 ..... 3, 5-7
G.S.C. Mem. 220 5-7
G.S.C. Mem. 234 ..... 6-8, 10, 12
G.S.C. Econ. Geol. 10 53
G.S.C. Mem. 284 ..... 95-98, 208, 219, 220
..... 223, 238, 317, 610, 645, 646
D.I.A.N.D. Yukon Min. Ind. 1941-1959 18-20
..... 25-27, 31, 32, 35, 36, 39, 42, 43
..... 48-50, 55-57, 62, 63, 69-71, 78-81
..... 87, 88, 90, 95, 101, 102, 109
..... 115, 121, 123, 128, 129, 134, 135
G.S.C. Paper 61-23 ..... 7, 8, 11, 12
G.S.C. Paper 62-27 ..... 5-8, 12, 13
G.S.C. Paper 63-38 ..... 41-43, 50, 51
G.S.C. Paper 64-36 ..... 51, 54, 61
G.S.C. Paper 65-19 ..... 54, 56, 61
G.S.C. Paper 66-31 ..... 87, 90, 99, 100, 102
G.S.C. Paper 67-40 ..... 71, 72, 78
G.S.C. Paper 68-68 ..... 91-93, 100, 101
G.S.C. Paper 69-55 ..... 55, 58, 59
D.I.A.N.D. Yukon Min. Ind. 1969-1970 ..... 143, 146
D.I.A.N.D. Yukon Min. Ind. 1971-1972 ..... 132, 133
D.I.A.N.D. Yukon Min. Ind. 1973 132
D.I.A.N.D. Yukon Min. Ind. 1974 ..... 172, 173
D.I.A.N.D. Yukon Min. Ind. 1975 179
D.I.A.N.D. Yukon Min. Ind. 1976 227
D.I.A.N.D. Yukon Min. Ind. 1977 101

Dublin Gulch

G.S.C. Sum. Rept. XVI 24A, 33A, 40A
G.S.C. Sum. Rept. 1911 40
G.S.C. Sum. Rept. 1915 ..... 19-22, 27-33
G.S.C. Pub. 958 16
G.S.C. Sum. Rept. 1916 12-19
G.S.C. Sum. Rept. 1918b 1, 4, 7, 10-15
G.S.C. Mem. 74 ..... 198, 200
G.S.C. Mem. 123 52
G.S.C. Sum. Rept. 1932A II 5
G.S.C. Sum. Rept. 1933A 5
G.S.C. Mem. 178 3
G.S.C. Mem. 193 3
G.S.C. Mem. 209 4
G.S.C. Mem. 218 8
G.S.C. Mem. 220 ..... 7, 8
G.S.C. Mem. 234 ..... 1, 15, 27, 31
G.S.C. Mem. 247 64
G.S.C. Econ. Geol. 7 62
G.S.C. Paper 50-14 15
G.S.C. Econ. Geol. 7 322
G.S.C. Econ. Geol. 17 ..... 8, 9, 12, 17
..... 21-29, 34-36
G.S.C. Mem. 284 ..... 137, 138, 141, 142, 351
..... 391-393, 401-406, 426-433
..... 463, 468-470, 472-477
..... 635, 636, 647
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 8
..... 14, 22, 28, 29, 33, 37, 44, 51, 59, 65
..... 82, 97, 111, 117, 123, 130, 135
G.S.C. Paper 61-23 ..... 14, 15

Page No.

G.S.C. Paper 62-27 ..... 17, 18
G.S.C. Paper 63-38 58-60
G.S.C. Paper 64-36 ..... 74, 76
G.S.C. Paper 65-19 ..... 70, 72
G.S.C. Paper 66-31 112
G.S.C. Paper 67-40 83
G.S.C. Paper 69-55 63
D.I.A.N.D. Yukon Min. Ind. 1969-1970 ..... 150, 151
D.I.A.N.D. Yukon Min. Ind. 1971-1972 137
D.I.A.N.D. Yukon Min. Ind. 1973 138
D.I.A.N.D. Yukon Min. Ind. 1974 180
D.I.A.N.D. Yukon Min. Ind. 1975 185
D.I.A.N.D. Yukon Min. Ind. 1976 233
D.I.A.N.D. Yukon Min. Ind. 1977 98

Duncan Creek

G.S.C. Sum. Rept. XVI 25A-29A, 37A, 38A, 40A
G.S.C. Sum. Rept. 1915 14-16
G.S.C. Sum. Rept. 1932A II 4
G.S.C. Sum. Rept. 1933A 4
G.S.C. Mem. 193 3
G.S.C. Mem. 209 4
G.S.C. Mem. 218 8
G.S.C. Mem. 220 ..... 7, 9
G.S.C. Mem. 234 15
G.S.C. Bull. 32 ..... 11, 12, 21, 25
G.S.C. Bull. 36 5
G.S.C. Mem. 284 ..... 127-143, 387-391, 635, 647
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 22
..... 130, 135
G.S.C. Paper 61-23 16
G.S.C. Paper 62-27 20
G.S.C. Paper 63-38 62
G.S.C. Paper 65-19 78
G.S.C. Paper 66-31 118
G.S.C. Paper 67-40 86
G.S.C. Paper 68-68 107
D.I.A.N.D. Yukon Min. Ind. 1975 184
D.I.A.N.D. Yukon Min. Ind. 1976 233
D.I.A.N.D. Yukon Min. Ind. 1977 96

Edmonton Creek

G.S.C. Sum. Rept. XVI 22A, 24A, 32A
G.S.C. Mem. 284 136

Eldorado Creek

G.S.C. Sum. Rept. IX 30R
G.S.C. Sum. Rept. XI 56A, 57A, 60A
..... 163A, 34R, 150S, 151S
G.S.C. Sum. Rept. XII 19A, 23A-28A
..... 33A, 37A, 38A, 44R
G.S.C. Sum. Rept. XIII 173A
G.S.C. Sum. Rept. XIV 35A, 6B, 8B, 11B
..... 18B, 26B-42B, 62B, 66B, 67B
G.S.C. Sum. Rept. XV 35AA
G.S.C. Pub. 979 ..... 17, 19, 30, 33
G.S.C. Sum. Rept. 1906 21
G.S.C. Pub. 1085 ..... Plate 73

Page No.

G.S.C. Sum. Rept. 1932A II 2, 3
G.S.C. Sum. Rept. 1933A 3
G.S.C. Mem. 193 ..... 3, 7
G.S.C. Mem. 218 5
G.S.C. Mem. 234 6
G.S.C. Econ. Geol. I (3) 266
G.S.C. Map 711A
G.S.C. Mem. 284 ..... 90-92, 226, 634, 645
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 51, 96
G.S.C. Paper 61-23 ..... 10, 11
G.S.C. Paper 62-27 10
G.S.C. Paper 63-38 ..... 47, 48
G.S.C. Paper 64-36 ..... 54, 58
G.S.C. Paper 65-19 ..... 56, 59
G.S.C. Paper 66-31 ..... 89, 96
G.S.C. Paper 67-40 ..... 73, 74, 76
G.S.C. Paper 68-68 ..... 97, 98
D.I.A.N.D. Yukon Min. Ind. 1969-1970 143
..... 147, 148
D.I.A.N.D. Yukon Min. Ind. 1971-1972 130
D.I.A.N.D. Yukon Min. Ind. 1973 128
D.I.A.N.D. Yukon Min. Ind. 1974 170
D.I.A.N.D. Yukon Min. Ind. 1975 180
D.I.A.N.D. Yukon Min. Ind. 1976 229
D.I.A.N.D. Yukon Min. Ind. 1977 102

Enchantment Creek

No References

Eureka Creek

G.S.C. Sum. Rept. XII 49A, 50A
G.S.C. Sum. Rept. XIV 7B, 55B-57B, 68B
G.S.C. Mem. 178 2
G.S.C. Mem. 209 3
G.S.C. Mem. 218 ..... 7, 8
G.S.C. Mem. 220 7
G.S.C. Mem. 234 6
G.S.C. Mem. 284 ..... 101, 102, 320
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 129, 134
G.S.C. Paper 61-23 12
G.S.C. Paper 62-27 ..... 13, 14
G.S.C. Paper 63-38 ..... 54, 55
G.S.C. Paper 64-36 64
G.S.C. Paper 65-19 63
G.S.C. Paper 66-31 102
D.I.A.N.D. Yukon Min. Ind. 1969-1970 148
D.I.A.N.D. Yukon Min. Ind. 1971-1972 133
D.I.A.N.D. Yukon Min. Ind. 1973 134
D.I.A.N.D. Yukon Min. Ind. 1974 173

Excelsior Creek

No References

Fourth of July Creek

G.S.C. Sum. Rept. XVI 1A, 10A, 12A

Page No.

G.S.C. Sum. Rept. 1905 24
G.S.C. Sum. Rept. 1914 14-18
G.S.C. Mem. 267 ..... 40, 41
G.S.C. Mem. 284 ..... 114, 121, 122
..... 149, 360, 362, 363
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 65, 66
D.I.A.N.D. Yukon Min. Ind. 1976 237

Gem Creek

G.S.C. Paper 48-25 11
G.S.C. Econ. Geol. 17 20
D.I.A.N.D. Yukon Min. Ind. 1973 137

Glacier Creek

G.S.C. Sum. Rept. IX 50R, 51R
G.S.C. Sum. Rept. XIV 33A-35A
G.S.C. Sum. Rept. 1917b 1, 6
G.S.C. Mem. 123 ..... 31, 37, 43
..... 44, 51, 54, 55
G.S.C. Sum. Rept. 1929A 2
G.S.C. Sum. Rept. 1932A II 4
G.S.C. Sum. Rept. 1933A 3, 4
G.S.C. Mem. 193 1
G.S.C. Mem. 220 4
G.S.C. Mem. 234 ..... 3, 4
G.S.C. Mem. 284 ..... 43, 44, 635, 646
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 14
..... 21, 40, 50, 57, 64, 70, 95
..... 103, 109, 115, 122, 128, 13A
G.S.C. Paper 62-27 15
G.S.C. Paper 65-19 67
G.S.C. Paper 68-68 ..... 104, 105
G.S.C. Paper 69-55 61
D.I.A.N.D. Yukon Min. Ind. 1969-1970 149
D.I.A.N.D. Yukon Min. Ind. 1971-1972 135
D.I.A.N.D. Yukon Min. Ind. 1973 147
D.I.A.N.D. Yukon Min. Ind. 1974 177
D.I.A.N.D. Yukon Min. Ind. 1975 174
D.I.A.N.D. Yukon Min. Ind. 1976 221
D.I.A.N.D. Yukon Min. Ind. 1977 105

Gladstone Creek

G.S.C. Sum. Rept. XVI 1A, 13A
G.S.C. Sum. Rept. 1914 ..... 15, 18, 19
G.S.C. Mem. 178 5
G.S.C. Mem. 193 6
G.S.C. Mem. 267 ..... 6, 7, 16, 36, 41
G.S.C. Mem. 284 ..... 363, 364
G.S.C. Paper 53-20 7
G.S.C. Paper 58-9 ..... 1, 8
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 40
..... 82, 90, 91, 97, 105, 111, 117
D.I.A.N.D. Yukon Min. Ind. 1974 184

Page No.

Gold Bottom Creek

G.S.C. Pub. 979 ..... 13, 24, 25
G.S.C. Sum. Rept. 1909 17
G.S.C. Mem. 234 12
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 51
..... 59, 65, 71, 81, 89, 96, 103, 110
..... 116, 122, 123, 129, 134, 135
G.S.C. Paper 61-23 ..... 10, 11
G.S.C. Paper 62-27 ..... 11, 12
G.S.C. Paper 63-38 ..... 49, 50
G.S.C. Paper 64-36 60
G.S.C. Paper 65-19 60
G.S.C. Paper 66-31 ..... 98, 99
G.S.C. Paper 67-40 77
G.S.C. Paper 68-68 ..... 99, 100
G.S.C. Paper 69-55 58
D.I.A.N.D. Yukon Min. Ind. 1969-1970 ..... 145, 152
D.I.A.N.D. Yukon Min. Ind. 1971-1972 132
D.I.A.N.D. Yukon Min. Ind. 1973 ..... 130, 131
D.I.A.N.D. Yukon Min. Ind. 1974 ..... 171, 172
D.I.A.N.D. Yukon Min. Ind. 1975 178
D.I.A.N.D. Yukon Min. Ind. 1976 226
D.I.A.N.D. Yukon Min. Ind. 1977 99

Gold Run Creek

G.S.C. Sum. Rept. XI 150S
G.S.C. Sum. Rept. XII 48A
G.S.C. Sum. Rept. XIII 185A, 41R
G.S.C. Sum. Rept. XIV 7B, 32B, 47B-52B
..... 59B, 67B, 68B
G.S.C. Sum. Rept. XV 39AA, 46A, 437A
G.S.C. Pub. 979 ..... 13, 34
G.S.C. Sum. Rept. 1930A 1
G.S.C. Sum. Rept. 1933A 3
G.S.C. Mem. 193 3
G.S.C. Mem. 234 12
G.S.C. Mem. 284 ..... 98, 99, 223
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 9, 20
..... 50, 51, 59
G.S.C. Paper 63-38 ..... 51, 52
G.S.C. Paper 64-36 62
G.S.C. Paper 65-19 ..... 55, 61
G.S.C. Paper 66-31 100
G.S.C. Paper 67-40 78
G.S.C. Paper 68-68 ..... 101, 102
G.S.C. Paper 69-55 59
D.I.A.N.D. Yukon Min. Ind. 1969-1970 ..... 147, 148
D.I.A.N.D. Yukon Min. Ind. 1977 101

Haggart Creek

G.S.C. Sum. Rept. XVI 19A, 24A, 32A, 33A, 340A
G.S.C. Sum. Rept. 1915 ..... 13, 19-22
G.S.C. Sum. Rept. 1916 ..... 13, 17
G.S.C. Mem. 74 198
G.S.C. Sum. Rept. 1932A II 4, 5
G.S.C. Sum. Rept. 1933A 4
G.S.C. Mem. 178 3
G.S.C. Mem. 193 3
G.S.C. Mem. 208 4
G.S.C. Mem. 218 8

Page No.

G.S.C. Mem. 220 7
G.S.C. Mem. 234 ..... 14, 15
G.S.C. Paper 48-25 2
G.S.C. Paper 50-14 15
G.S.C. Mem. 284 ..... 137, 141, 391-394
..... 428-433, 475, 635, 647
G.S.C. Econ. Geol. 17 ..... 17, 21, 24, 28
G.S.C. Bull. 36 5
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 22
..... 28, 97, 104, 111
..... 117, 123, 130, 135
G.S.C. Paper 61-23 15
G.S.C. Paper 62-27 ..... 13, 18
G.S.C. Paper 63-38 ..... 57, 58
G.S.C. Paper 64-36 74
G.S.C. Paper 65-19 ..... 70, 71
G.S.C. Paper 66-31 110
G.S.C. Paper 67-40 82
G.S.C. Paper 68-68 ..... 106, 107
G.S.C. Paper 69-55 62
D.I.A.N.D. Yukon Min. Ind. 1969-1970 ..... 150, 151
D.I.A.N.D. Yukon Min. Ind. 1971-1972 ..... 137, 138

Henderson Creek

G.S.C. Sum. Rept. XIV 32A, 16B
G.S.C. Sum. Rept. 123 24
G.S.C. Mem. 178 ..... 2, 3
G.S.C. Mem. 218 ..... 7, 8
G.S.C. Map 711A
G.S.C. Mem. 284 42
G.S.C. Econ. Geol. I 354
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 8
..... 20, 40, 44, 50, 58, 64, 71
..... 81, 89, 95, 103, 109, 116, 122
G.S.C. Paper 61-23 14
G.S.C. Paper 64-36 73
G.S.C. Paper 65-19 68
G.S.C. Paper 66-31 109
D.I.A.N.D. Yukon Min. Ind. 1976 231
D.I.A.N.D. Yukon Min. Ind. 1977 ..... 103, 104

Highet Creek

G.S.C. Sum. Rept. XVI 20A, 34A, 38A
..... 40A, 340A, 39R
G.S.C. Pub. 958 ..... 11, 13, 16
G.S.C. Sum. Rept. 1915 ..... 15, 16, 23, 24
G.S.C. Mem. 74 ..... 42, 198
G.S.C. Sum. Rept. 1918b 14, 15
G.S.C. Sum. Rept. 1932A II 4, 5
G.S.C. Sum. Rept. 1933A 4
G.S.C. Mem. 178 3
G.S.C. Mem. 193 3
G.S.C. Mem. 209 4
G.S.C. Mem. 218 8
G.S.C. Mem. 220 ..... 7, 8, 14
G.S.C. Mem. 234 ..... 1, 14, 28, 32-34
G.S.C. Paper 48-25 ..... 3, 10, 11
G.S.C. Econ. Geol. I 354
G.S.C. Econ. Geol. 17 ..... 20, 21, 30-34
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 22
..... 29, 33, 37, 44, 51, 59, 65

Page No.
..... 90, 97, 104, 130, 135
G.S.C. Paper 61-23 ..... 11, 15, 16
G.S.C. Paper 62-27 19
G.S.C. Paper 63-38 ..... 60, 61
G.S.C. Paper 64-36 78
G.S.C. Paper 65-19 73
G.S.C. Paper 66-31 ..... 113, 114
G.S.C. Paper 67-40 83
G.S.C. Paper 68-68 ..... 108, 109
G.S.C. Paper 69-55 ..... 63, 64
D.I.A.N.D. Yukon Min. Ind. 1969-1970 151
D.I.A.N.D. Yukon Min. Ind. 1971-1972 138
D.I.A.N.D. Yukon Min. Ind. 1973 139
D.I.A.N.D. Yukon Min. Ind. 1974 181
D.I.A.N.D. Yukon Min. Ind. 1975 184
D.I.A.N.D. Yukon Min. Ind. 1976 235
D.I.A.N.D. Yukon Min. Ind. 1977 96

Hunker Creek

G.S.C. Sum. Rept. XI 56A, 57A, 60A
..... 15R, 34R, 150S, 151S
G.S.C. Sum. Rept. XII 19A, 23A, 24A
..... 26A-28A, 39A-41A, 16R, 17R
G.S.C. Sum. Rept. XIV 5B, 7B, 15B, 22B
..... 23B, 27B, 28B, 30B, 32B
..... 43B-46B, 49B, 67B, 68B
G.S.C. Sum. Rept. XV 37AA, 45A-47A, 438A
G.S.C. Pub. 979 ..... 6, 7, 9, 12
..... 13, 16, 23, 29-34
G.S.C. Sum. Rept. 1906 21
G.S.C. Sum. Rept. 1909 ..... 17, 18
G.S.C. Mem. 74 ..... 53, 99
G.S.C. Sum. Rept. 1929A 2
G.S.C. Sum. Rept. 1930A 1A
G.S.C. Sum. Rept. 1932A II 2, 3
G.S.C. Sum. Rept. 1933A 2
G.S.C. Mem. 178 2
G.S.C. Mem. 193 ..... 2, 3
G.S.C. Mem. 209 ..... 1, 3
G.S.C. Mem. 218 ..... 3, 5, 7
G.S.C. Mem. 220 4-7
G.S.C. Mem. 234 ..... 6-8, 10, 12
G.S.C. Mem. 284 ..... 92-94, 207, 208
..... 220-223, 230, 231, 233-235
..... 237, 348, 596, 634, 645

Indian River

G.S.C. Sum. Rept. XII 17A, 51A
G.S.C. Sum. Rept. XV 37AA
G.S.C. Sum. Rept. XIV 6B, 8B, 9B, 47B-56B
G.S.C. Pub. 979 ..... 13, 34
G.S.C. Sum. Rept. 1906 21
G.S.C. Sum. Rept. 1932A II 2, 3
G.S.C. Sum. Rept. 1933A 2
G.S.C. Mem. 193 2
G.S.C. Mem. 218 5
G.S.C. Mem. 234 6
G.S.C. Econ. Geol. 10 53
G.S.C. Mem. 284 ..... 66, 80, 95-102, 208
..... 223, 237, 238, 633-635, 645
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 20, 134
D.I.A.N.D. Yukon Min. Ind. 1977 105

Page No.

Jackson Hill (Klondike River)

G.S.C. Mem. 284 ..... 596, 610, 645
D.I.A.N.D. Yukon Min. Ind. 1973 127
D.I.A.N.D. Yukon Min. Ind. 1974 169
G.S.C. Paper 62-27 ..... 15, 16
G.S.C. Paper 63-38 57
G.S.C. Paper 64-36 72
G.S.C. Paper 65-19 67
G.S.C. Paper 66-31 108
G.S.C. Paper 67-40 81

Johnson Creek

G.S.C. Pub. 982 37
G.S.C. Sum. Rept. 1915 ..... 25, 26, 34
G.S.C. Sum. Rept. 1918b 14
G.S.C. Mem. 220 14
G.S.C. Mem. 234 32
G.S.C. Mem. 284 ..... 140, 398, 399, 476, 477
G.S.C. Econ. Geol. 17 ..... 20, 30-34
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 117
..... 123, 130, 135
G.S.C. Paper 61-23 16
G.S.C. Paper 62-27 ..... 19, 20
G.S.C. Paper 63-38 ..... 61, 62
G.S.C. Paper 64-36 ..... 78, 79
G.S.C. Paper 66-31 115
G.S.C. Paper 67-40 84
G.S.C. Paper 68-68 109
D.I.A.N.D. Yukon Min. Ind. 1976 236
D.I.A.N.D. Yukon Min. Ind. 1977 96

Josephine Creek

No References

Keystone Creek

G.S.C. Sum. Rept. XVI 32A
G.S.C. Mem. 284 137

Kirkman Creek

G.S.C. Sum. Rept. 1915 34-36
G.S.C. Mem. 97 ..... 1, 3, 4, 9-13
..... 31-34, 43
G.S.C. Mem. 178 3
G.S.C. Mem. 193 4
G.S.C. Mem. 209 4
G.S.C. Mem. 218 8
G.S.C. Mem. 220 10
G.S.C. Mem. 234 16
G.S.C. Mem. 284 ..... 409, 410
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 22
..... 44, 123, 129, 135
G.S.C. Paper 61-23 13-14
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 7, 14
..... 18-20, 26, 27, 32, 35, 39

Page No.
..... 42, 43, 48, 49, 51, 55, 56
..... 59, 62, 63, 65, 69-72
..... 79-81, 87-90, 95, 96
..... 101-104, 109, 110, 115-117
..... 121-123, 128, 129, 134, 135
G.S.C. Paper 61-23 ..... 7, 8, 10
G.S.C. Paper 62-27 ..... 5, 6, 10, 11
G.S.C. Paper 63-38 ..... 41, 44, 48, 49
G.S.C. Paper 64-36 ..... 53, 59
G.S.C. Paper 65-19 ..... 55, 59
G.S.C. Paper 66-31 ..... 89, 97
G.S.C. Paper 67-40 ..... 72, 76
G.S.C. Paper 68-68 ..... 91, 92, 99
G.S.C. Paper 69-55 57
D.I.A.N.D. Yukon Min. Ind. 1969-1970 146
D.I.A.N.D. Yukon Min. Ind. 1971-1972 131
D.I.A.N.D. Yukon Min. Ind. 1973 129-131
D.I.A.N.D. Yukon Min. Ind. 1974 170-172
D.I.A.N.D. Yukon Min. Ind. 1975 ..... 177, 178
D.I.A.N.D. Yukon Min. Ind. 1976 ..... 225, 226, 232
D.I.A.N.D. Yukon Min. Ind. 1977 ..... 99, 101

Klondike River

G.S.C. Sum. Rept. XIV 39A, 30B, 33B-47B, 66B
G.S.C. Sum. Rept. 1906 ..... 20, 21
G.S.C. Sum. Rept. 1909 17
G.S.C. Pub. 1097 13
G.S.C. Mem. 74 172
G.S.C. Sum. Rept. 1929A 1, 2
G.S.C. Sum. Rept. 1930A 1
G.S.C. Sum. Rept. 1932A II 2-4
G.S.C. Sum. Rept. 1933A 1-3
G.S.C. Mem. 178 ..... 1, 2
G.S.C. Mem. 193 2
G.S.C. Mem. 209 1-4
G.S.C. Mem. 218 3-7
G.S.C. Mem. 220 4-7
G.S.C. Mem. 234 ..... 4-12, 27
G.S.C. Econ. Geol. 1 (3) 229, 262, 265
G.S.C. Econ. Geol. 7 ..... 51, 100
G.S.C. Econ. Geol. 10 50-55
G.S.C. Paper 50-14 12
G.S.C. Mem. 284 ..... 85-95, 112, 217-237
..... 481, 610, 634, 645
D.I.A.N.D. Yukon Min. Ind. 1941-1959 18-20
..... 26, 27, 31, 32, 35, 36, 39
..... 42, 43, 48, 49, 55, 56, 62
..... 63, 69, 70, 78-80, 87, 88
..... 96, 101, 109, 110, 115-117
.....122, 123, 129, 135
G.S.C. Paper 61-23 11
G.S.C. Paper 64-36 67
G.S.C. Paper 65-19 64
G.S.C. Paper 66-31 104
G.S.C. Paper 67-40 79
D.I.A.N.D. Yukon Min. Ind. 1969-1970 143

Page No.

Lake Creek

G.S.C. Sum. Rept. XIII 40A
G.S.C. Sum. Rept. XIV 30A
G.S.C. Mem. 284 ..... 611, 624, 625, 637, 647
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 29
D.I.A.N.D. Yukon Min. Ind. 1973 149
D.I.A.N.D. Yukon Min. Ind. 1976 239

Last Chance Creek

G.S.C. Sum. Rept. XII 26A, 41A
G.S.C. Sum. Rept. XIV 11B, 23B, 26B
..... 27B, 43B, 44B, 46B
G.S.C. Pub. 979 ..... 10, 25, 27
G.S.C. Mem. 149 ..... 163, 168, 171
G.S.C. Mem. 234 12
G.S.C. Mem. 284 ..... 94, 221, 231-234
D.I.A.N.D. Yukon Min. Ind. 1941-1959 .... 22, 33, 51, 71
..... 81, 89, 96, 103, 110
..... 116, 122, 129, 134
G.S.C. Paper 66-31 97
G.S.C. Paper 67-40 76
G.S.C. Paper 68-68 99
G.S.C. Paper 69-55 ..... 57, 58
D.I.A.N.D. Yukon Min. Ind. 1969-1970 148
D.I.A.N.D. Yukon Min. Ind. 1971-1972 132
D.I.A.N.D. Yukon Min. Ind. 1973 130
D.I.A.N.D. Yukon Min. Ind. 1974 171
D.I.A.N.D. Yukon Min. Ind. 1975 177
D.I.A.N.D. Yukon Min. Ind. 1976 225
D.I.A.N.D. Yukon Min. Ind. 1977 99

Ledge Creek

G.S.C. Sum. Rept. XVI 24A, 30A, 37A, 40A
G.S.C. Mem. 193 4
G.S.C. Mem. 209 4
G.S.C. Mem. 218 8
G.S.C. Mem. 220 9
G.S.C. Mem. 234 15
G.S.C. Mem. 284 ..... 135, 140
G.S.C. Econ. Geol. 17 29
D.I.A.N.D. Yukon Min. Ind. 1941-1959 65

Lightning Creek

G.S.C. Sum. Rept. XVI 24A, 26A, 29A
G.S.C. Sum. Rept. 1915 ..... 16, 17, 19, 33
G.S.C. Sum. Rept. 1933A 4
G.S.C. Bull. 32 ..... 8, 9, 11, 12
..... 25, 26, 28, 30
G.S.C. Mem. 284 ..... 132, 135, 390
..... 489, 490, 525, 647
G.S.C. Paper 55-30 ..... 3, 28, 48
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 22

Page No.
D.I.A.N.D. Yukon Min. Ind. 1969-1970 151
D.I.A.N.D. Yukon Min. Ind. 1976 233
D.I.A.N.D. Yukon Min. Ind. 1977 96

Little Gold Creek

G.S.C. Sum. Rept. 1917b 7
G.S.C. Mem. 123 ..... 17, 34, 45
G.S.C. Sum. Rept. 1932A II 4
G.S.C. Mem. 220 4
G.S.C. Mem. 284 635
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 81
..... 89, 95, 103, 110, 116

Livingstone Creek

G.S.C. Sum. Rept. XIV 25A, 27A-29A
G.S.C. Sum. Rept. 1907 ..... 10, 14
G.S.C. Mem. 5 16
G.S.C. Sum. Rept. 1930A 2
G.S.C. Sum. Rept. 1931A 1-5
G.S.C. Sum. Rept. 1932A II 1, 6
G.S.C. Sum. Rept. 1933A 4
G.S.C. Mem. 178 3
G.S.C. Mem. 193 ..... 4, 5
G.S.C. Mem. 203 ..... 23, 24
G.S.C. Mem. 209 5
G.S.C. Mem. 217 ..... 1, 22-24
G.S.C. Mem. 234 16
G.S.C. Paper 36-2 3
G.S.C. Paper 50-14 11
G.S.C. Mem. 284 620-626
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 23
..... 34, 45, 59, 82
G.S.C. Paper 61-23 20
D.I.A.N.D. Yukon Min. Ind. 1975 187
D.I.A.N.D. Yukon Min. Ind. 1976 239
D.I.A.N.D. Yukon Min. Ind. 1977 108

Maisy May Creek

D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 37

Matson Creek

G.S.C. Sum. Rept. 1917b 7
G.S.C. Mem. 123 ..... 17, 20-22, 29
..... 31, 33, 37, 47, 52
G.S.C. Sum. Rept. 1932A II 4
G.S.C. Sum. Rept. 1933A 4
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 37, 78

Mayo Lake Area

G.S.C. Sum. Rept. XVI 21A, 24A, 20C
G.S.C. Mem. 178 3
G.S.C. Mem. 193 4

Page No.
G.S.C. Econ. Geol. I 4th edit. 351
G.S.C. Bull. 32 8
G.S.C. Mem. 284 ..... 127-143, 381-407
..... 461-616, 635-648

McIntyre Creek

G.S.C. Sum. Rept. XVI 36A
D.I.A.N.D. Yukon Min. Ind. 1941-1959 8

McLagan Creek

G.S.C. Sum. Rept. XVI 24A
D.I.A.N.D. Yukon Min. Ind. 1941-1959 8
G.S.C. Paper 66-31 116
G.S.C. Paper 67-40 85
G.S.C. Paper 68-68 ..... 110, 111

Miller Creek

G.S.C. Sum. Rept. VII 129S
G.S.C. Sum. Rept. XIII 40R
G.S.C. Sum. Rept. XIV 33A-35A, 62B
G.S.C. Sum. Rept. 1917b 1, 5, 6, 8, 9
G.S.C. Mem. 123 ..... 17, 31, 37
..... 41, 42, 50-52
G.S.C. Sum. Rept. 1929A 2
G.S.C. Sum. Rept. 1930A 1
G.S.C. Sum. Rept. 1932A II 4
G.S.C. Sum. Rept. 1933A 3
G.S.C. Mem. 178 3
G.S.C. Mem. 193 1
G.S.C. Mem. 209 1
G.S.C. Mem. 220 ..... 3, 4
G.S.C. Mem. 234 4
G.S.C. Mem. 284 ..... 43, 44, 635, 646
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 21, 59
..... 104, 111, 117, 123, 129, 135
G.S.C. Paper 61-23 13
G.S.C. Paper 62-27 15
G.S.C. Paper 63-38 ..... 56, 57
G.S.C. Paper 64-36 69
G.S.C. Paper 65-19 67
G.S.C. Paper 69-55 61
D.I.A.N.D. Yukon Min. Ind. 1969-1970 149
D.I.A.N.D. Yukon Min. Ind. 1974 177
D.I.A.N.D. Yukon Min. Ind. 1975 176
D.I.A.N.D. Yukon Min. Ind. 1976 222
D.I.A.N.D. Yukon Min. Ind. 1977 105

Minto Creek

G.S.C. Sum. Rept. XVI 36A
G.S.C. Sum. Rept. 1915 ..... 16, 22, 23
G.S.C. Paper 48-25 2
G.S.C. Map 890A
G.S.C. Econ. Geol. 17 21
G.S.C. Mem. 284 ..... 139, 140, 394, 395

Page No.
D.I.A.N.D. Yukon Min. Ind. 1941-1959 8
G.S.C. Paper 68-68 110

Moose Creek (Fortymile River Area)

G.S.C. Mem. 220 3
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 37
..... 59, 65, 72, 81, 104

Moose Creek (Livingstone Creek Area)

G.S.C. Sum. Rept. XVI 21A
D.I.A.N.D. Yukon Min. Ind. 1975 187
D.I.A.N.D. Yukon Min. Ind. 1976 239

Moosehorn Range

D.I.A.N.D. Yukon Min. Ind. 1975 191
D.I.A.N.D. Yukon Min. Ind. 1976 46-50
D.I.A.N.D. Yukon Min. Ind. 1977 108

Morrison Creek

D.I.A.N.D. Yukon Min. Ind. 1975 185

Nansen Creek

G.S.C. Sum. Rept. 1914 25-29
G.S.C. Sum. Rept. 1933A 4, 8
G.S.C. Mem. 178 3
G.S.C. Mem. 189 ..... 9, 10, 48, 51, 52, 57
G.S.C. Mem. 193 4
G.S.C. Mem. 209 4
G.S.C. Mem. 234 16
G.S.C. Mem. 268 9
G.S.C. Mem. 284 ..... 357, 371-374, 626
..... 639, 640, 647, 650
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 38
..... 44, 51, 59, 65, 66
G.S.C. Paper 63-38 64
G.S.C. Paper 64-36 83
G.S.C. Paper 65-19 82
D.I.A.N.D. Yukon Min. Ind. 1976 240
D.I.A.N.D. Yukon Min. Ind. 1977 108

Nelson Creek

G.S.C. Sum. Rept. XVI 22A, 21C

Owl Creek

G.S.C. Mem. 193 4
G.S.C. Mem. 220 ..... 7, 8

Page No.

Pedlar Creek

No References

Ping Pong Creek

No References

Quartz Creek

G.S.C. Sum. Rept. X 182S
G.S.C. Sum. Rept. XI 150S, 151S
G.S.C. Sum. Rept. XII 19A, 26A, 49A
..... 208A, 13R, 14R
G.S.C. Sum. Rept. XIV 5B, 7B, 9B, 11B
..... 24B, 30B, 54B, 55B, 68B
G.S.C. Pub. 979 34
G.S.C. Sum. Rept. 1906 21
G.S.C. Sum. Rept. 1913 327
G.S.C. Mem. 74 ..... 167, 218
G.S.C. Sum. Rept. 1930A 1
G.S.C. Sum. Rept. 1932A II 3
G.S.C. Sum. Rept. 1933A 2, 3
G.S.C. Mem. 178 2
G.S.C. Mem. 193 ..... 2, 3
G.S.C. Mem. 209 ..... 2, 3
G.S.C. Mem. 218 5-7
G.S.C. Mem. 220 ..... 6, 7
G.S.C. Mem. 234 ..... 6-9, 12
G.S.C. Mem. 284 ..... 100, 101, 208
..... 238, 634, 645, 646
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 18-20
..... 25-27, 31, 32, 35, 36, 39
..... 42, 43, 49, 56, 63, 69-71
..... 78, 80, 90, 123, 129, 135
G.S.C. Paper 61-23 12
G.S.C. Paper 62-27 14
G.S.C. Paper 63-38 ..... 41, 52-54
G.S.C. Paper 64-36 63
G.S.C. Paper 65-19 ..... 56, 62
G.S.C. Paper 66-31 ..... 91, 102
G.S.C. Paper 67-40 ..... 73, 78
G.S.C. Paper 68-68 ..... 92, 93, 102
G.S.C. Paper 69-55 ..... 55, 60
D.I.A.N.D. Yukon Min. Ind. 1969-1970 ..... 143, 147, 149
D.I.A.N.D. Yukon Min. Ind. 1971-1972 133
D.I.A.N.D. Yukon Min. Ind. 1973 ..... 133, 134
D.I.A.N.D. Yukon Min. Ind. 1974 174
D.I.A.N.D. Yukon Min. Ind. 1975 180
D.I.A.N.D. Yukon Min. Ind. 1976 228
D.I.A.N.D. Yukon Min. Ind. 1977 102

Ready Bullion Creek

G.S.C. Sum. Rept. XII 36A
G.S.C. Sum. Rept. XIV 39B, 40B
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 104, 110, 116
D.I.A.N.D. Yukon Min. Ind. 1976 230
D.I.A.N.D. Yukon Min. Ind. 1977 103

Page No.

Revenue Creek

G.S.C. Paper 69-55 66
D.I.A.N.D. Yukon Min. Ind. 1974 171
D.I.A.N.D. Yukon Min. Ind. 1975 190

Rude Creek

G.S.C. Sum. Rept. 1916 ..... 20, 29-33
G.S.C. Mem. 178 3
G.S.C. Mem. 193 4
G.S.C. Mem. 218 8
G.S.C. Mem. 284 ..... 434, 442, 445, 581

Russell Creek

G.S.C. Sum. Rept. XV 24A, 34A, 37A
G.S.C. Pub. 1097 34
G.S.C. Mem. 193 4

Scroggie Creek

G.S.C. Sum. Rept. XIII 43A
G.S.C. Sum. Rept. 1915 ..... 34, 35
G.S.C. Mem. 97 ..... 1, 3, 9-22, 34
G.S.C. Sum. Rept. 1918g 13
G.S.C. Mem. 178 3
G.S.C. Mem. 193 4
G.S.C. Mem. 209 4
G.S.C. Mem. 218 8
G.S.C. Mem. 220 10
G.S.C. Mem. 234 16
G.S.C. Map 711A
G.S.C. Mem. 284 407-409
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 37
..... 40, 90, 96, 104, 110, 117, 123

Seattle Creek

G.S.C. Paper 48-25 4

Sixty Mile River

G.S.C. Sum. Rept. III 141R
G.S.C. Sum. Rept. IV 142D, 143D
G.S.C. Sum. Rept. X 182S
G.S.C. Sum. Rept. XI 150S
G.S.C. Sum. Rept. XIII 41R
G.S.C. Sum. Rept. XIV 36A-38A, 58
G.S.C. Sum. Rept. 1909 23
G.S.C. Mem. 123 ..... 2, 5, 7, 10, 35
..... 36, 41, 46, 47, 51, 52, 55, 56
G.S.C. Sum. Rept. 1917b 1-9
G.S.C. Sum. Rept. 1929A 2
G.S.C. Sum. Rept. 1930A 1
G.S.C. Sum. Rept. 1932A 1, 4
G.S.C. Sum. Rept. 1933A 3, 4

Page No.

G.S.C. Mem. 284 ..... 45-48, 597, 635
G.S.C. Econ. Geol. 1, 4th edit. 351, 354
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 21
..... 28, 33, 40, 44, 50, 51, 65, 70
..... 71, 78, 81, 117, 123, 130, 134
G.S.C. Paper 61-23 13
G.S.C. Paper 64-36 69
G.S.C. Paper 65-19 66
G.S.C. Paper 66-31 105-108
G.S.C. Paper 67-40 80
G.S.C. Paper 68-68 ..... 103, 104
D.I.A.N.D. Yukon Min. Ind. 1969-1970 149
D.I.A.N.D. Yukon Min. Ind. 1971-1972 135
D.I.A.N.D. Yukon Min. Ind. 1973 147
D.I.A.N.D. Yukon Min. Ind. 1974 177
D.I.A.N.D. Yukon Min. Ind. 1975 ..... 174, 176
D.I.A.N.D. Yukon Min. Ind. 1976 ..... 221, 222
D.I.A.N.D. Yukon Min. Ind. 1977 ..... 105, 107

Sprague Creek

G.S.C. Paper 48-25 5

Squaw (Dollis) Creek

G.S.C. Sum. Rept. 1927A 7
B.C.D.M. Ann. Rept. 1927 110
B.C.D.M. Ann. Rept. 1928 123
G.S.C. Sum. Rept. 1929A 2
B.C.D.M. Ann. Rept. 1931 64
G.S.C. Sum. Rept. 1932A II 6
B.C.D.M. Ann. Rept. 1932 ..... 74, 77
G.S.C. Sum. Rept. 1933A 4
B.C.D.M. Ann. Rept. 1933 91
B.C.D.M. Bull. 1, 1933 32
G.S.C. Mem. 178 5
G.S.C. Mem. 193 6
B.C.D.M. Ann. Rept. 1935 ..... B28, G47
G.S.C. Mem. 220 10
B.C.D.M. Ann. Rept. 1936 ..... B60
B.C.D.M. Ann. Rept. 1937 ..... B3, B45
B.C.D.M. Ann. Rept. 1938 ..... B30
B.C.D.M. Ann. Rept. 1939 104
G.S.C. Mem. 234 ..... 14, 18
G.S.C. Mem. 268 ..... 48, 50-52
G.S.C. Mem. 284 ..... 576, 597, 637, 647
B.C.D.M. Ann. Rept.1940 89
B.C.D.M. Ann. Rept.1941 84
G.S.C. Bull. 5 18
G.S.C. Paper 47-15 14
B.C.D.M. Bull. 25 1948 36
G.S.C. Paper 49-24 ..... 1, 29
B.C.D.M. Bull. 28 1950 ..... 7, 17, 20
B.C.D.M. Ann. Rept. 1959 145
B.C.D.M. Ann. Rept. 1960 120
B.C.D.M. Ann. Rept. 1961 127
B.C.D.M. Ann. Rept. 1966 254
B.C.D.M. Geo. Expln. Min. 1974 374
G.S.C. Paper 61-23 19

Page No.

Squirrel Creek

No References

Steep Creek

G.S.C. Sum. Rept. XVI 31A, 32A, 37A
G.S.C. Mem. 193 4
G.S.C. Mem. 220 ..... 7, 9
G.S.C. Mem. 234 15

Stewart River

G.S.C. Sum. Rept. III 181B, 182B, 140R
G.S.C. Sum. Rept. IV 28D, 29D, 143D
G.S.C. Sum. Rept. VII 129S
G.S.C. Sum. Rept. XI 150S
G.S.C. Sum. Rept. XIII 39A-43A
G.S.C. Sum. Rept. XIV 39A, 5B
G.S.C. Sum. Rept. XVI ..... Pt. C
G.S.C. Sum. Rept. 1905 32-36
G.S.C. Sum. Rept. 1908 36
G.S.C. Sum. Rept. 1909 22
G.S.C. Sum. Rept. 1915 ..... 13, 14
G.S.C. Paper 45-21 7
G.S.C. Paper 48-25 ..... 3, 10, 11
G.S.C. Mem. 218 8
G.S.C. Mem. 220 9
G.S.C. Econ. Geol. 13 108
G.S.C. Map 890A
G.S.C. Mem. 284 ..... 26-29, 126-143
..... 156-173, 323, 381, 408
G.S.C. Paper 53-7 ..... 1, 5, 10, 26
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 33, 90
G.S.C. Paper 65-19 64-66
G.S.C. Paper 68-68 105
G.S.C. Paper 69-55 62

Stoddart Creek

G.S.C. Mem. 178 3
G.S.C. Mem. 189 52
G.S.C. Sum. Rept. 1932A II 5

Sulphur Creek

G.S.C. Sum. Rept. X 182S
G.S.C. Sum. Rept. XI 150S
G.S.C. Sum. Rept. XII 19A, 27A, 45A-47A, 56A
G.S.C. Sum. Rept. XIII 172A
G.S.C. Sum. Rept. XIV 7B, 19B, 32B
..... 47B-54B, 64B, 68B
G.S.C. Pub. 979 ..... 13, 34
G.S.C. Sum. Rept. 1906 21
G.S.C. Sum. Rept. 1930A 1
G.S.C. Sum. Rept. 1932A II 3
G.S.C. Sum. Rept. 1933A 3
G.S.C. Mem. 193 ..... 2, 3
G.S.C. Mem. 209 ..... 2, 3
G.S.C. Mem. 218 ..... 3, 5

Page No.

G.S.C. Mem. 220 6
G.S.C. Mem. 234 6-10
G.S.C. Mem. 284 ..... 99, 100, 208
..... 223, 238, 634, 645
D.I.A.N.D. Yukon Min. Ind. 1941-1959 18-20
..... 25-27, 31, 39, 42, 43, 48, 49
..... 55, 56, 62, 63, 69, 70, 79
..... 80, 87, 88, 95, 101, 102
..... 109, 115, 121, 128, 134
G.S.C. Paper 61-23 7
G.S.C. Paper 62-27 ..... 5, 6
G.S.C. Paper 63-38 ..... 41, 43, 44
G.S.C. Paper 64-36 63
G.S.C. Paper 65-19 ..... 55, 62
G.S.C. Paper 66-31 ..... 88, 101
G.S.C. Paper 67-40 ..... 71, 78
D.I.A.N.D. Yukon Min. Ind. 1969-1970 145
D.I.A.N.D. Yukon Min. Ind. 1973 134
D.I.A.N.D. Yukon Min. Ind. 1974 174
D.I.A.N.D. Yukon Min. Ind. 1975 179
D.I.A.N.D. Yukon Min. Ind. 1976 228
D.I.A.N.D. Yukon Min. Ind. 1977 102

Summit Creek (Livingstone Creek Area)

G.S.C. Sum. Rept. XIV 29A
G.S.C. Sum. Rept. 1931A 1, 6
G.S.C. Sum. Rept. 1932A II 6
G.S.C. Sum. Rept. 1933A 4
G.S.C. Sum. Rept. Mem. 284 ..... 620, 625, 647

Tatamagouche Creek

G.S.C. Sum. Rept. 1916 ..... 23, 25
G.S.C. Econ. Geol. 13 ..... 109, 110
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 29, 51, 65
D.I.A.N.D. Yukon Min. Ind. 1971-1972 138
D.I.A.N.D. Yukon Min. Ind. 1973 143
D.I.A.N.D. Yukon Min. Ind. 1974 184
D.I.A.N.D. Yukon Min. Ind. 1975 188
D.I.A.N.D. Yukon Min. Ind. 1977 108

Ten Mile Creek

D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 117
..... 123, 130, 135
D.I.A.N.D. Yukon Min. Ind. 1973 147
D.I.A.N.D. Yukon Min. Ind. 1975 176
D.I.A.N.D. Yukon Min. Ind. 1976 223
D.I.A.N.D. Yukon Min. Ind. 1977 107

Thistle Creek

G.S.C. Sum. Rept. XIV 31A, 32A, 237A
G.S.C. Sum. Rept. XV 432A
G.S.C. Sum. Rept. 1915 34-36
G.S.C. Mem. 97 ..... 3, 9-13, 27-31
..... 34, 37, 39, 41
G.S.C. Sum. Rept. 1929A 2

Page No.
G.S.C. Sum. Rept. 1930A 1
G.S.C. Sum. Rept. 1933A 4
G.S.C. Mem. 178 3
G.S.C. Mem. 193 4
G.S.C. Mem. 209 4
G.S.C. Mem. 218 8
G.S.C. Mem. 220 10
G.S.C. Mem. 234 16
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 8, 22
..... 37, 40, 44, 50, 58, 64, 65, 71
..... 81, 89, 95, 103, 109, 116, 122
G.S.C. Paper 62-27 16
G.S.C. Paper 64-36 72
G.S.C. Paper 65-19 68

Thunder Gulch

G.S.C. Mem. 220 ..... 7, 9
G.S.C. Bull. 32 11
D.I.A.N.D. Yukon Min. Ind. 1941-1959 9
G.S.C. Paper 63-38 62
G.S.C. Paper 65-19 78
G.S.C. Paper 68-68 ..... 111, 112
G.S.C. Paper 69-55 ..... 64, 65
D.I.A.N.D. Yukon Min. Ind. 1969-1970 151
D.I.A.N.D. Yukon Min. Ind. 1971-1972 137
D.I.A.N.D. Yukon Min. Ind. 1973 140
D.I.A.N.D. Yukon Min. Ind. 1974 181
D.I.A.N.D. Yukon Min. Ind. 1975 184
D.I.A.N.D. Yukon Min. Ind. 1976 233
D.I.A.N.D. Yukon Min. Ind. 1977 96

Victoria Gulch

G.S.C. Sum. Rept. XII 36A
G.S.C. Sum. Rept. XIV 37A, 233A
..... 34B-40B, 62B-65B
G.S.C. Pub. 979 30
G.S.C. Sum. Rept. 1909 21
G.S.C. Sum. Rept. 1929A 2
G.S.C. Mem. 193 7
G.S.C. Mem. 284 ..... 46, 47, 319, 322
D.I.A.N.D. Yukon Min. Ind. 1941-1959 ..... 9, 44, 51
G.S.C. Paper 63-38 47
G.S.C. Paper 64-36 58
G.S.C. Paper 65-19 59
G.S.C. Paper 66-31 96
G.S.C. Paper 67-40 76
G.S.C. Paper 68-68 97
G.S.C. Paper 69-55 57
D.I.A.N.D. Yukon Min. Ind. 1971-1972 131
D.I.A.N.D. Yukon Min. Ind. 1973 129
D.I.A.N.D. Yukon Min. Ind. 1977 103

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INDEX

Abel, B.....157
Abbott, J.G.....1
Ace Placer Mines.....132,134
Adams Creek.....4,13,14,151,152
Adams, K.....131
Adams Gulch.....10,170
Agate Creek.....4
Ahnert, G.....129
Airgold Ltd.....132,142
Alaska.....29
Alberta Creek.....4
Alder Creek.....3
Alexander, M.....71
Allison, A.....85
Allgold Creek.....4,6,10,13,14,130,131,170
Allgold Holdings.....131
Allgold Placers.....132
Almeda Pup.....133
Alton, J.....129
Alsace Mining.....88
American Gulch.....4,10
Anderson Creek.....10,13,14,73,170
Anderson, G.....149
Arch Creek.....13,14,87,170
Arch Creek Mining Ltd.....114
Archibald, J.....146
Archibald, R.....146
Arctic Eldorado Mining Co.....156
Arctic Ocean.....169
Arctic Rim Operators Ltd.....139,142,159
Ardill Construction Ltd.....94
Arizona Creek.....114,170
Ashley, C.....130
Asuchak, G.....67
Asuchak, R.....67
Atlantic Energy Corp.....97
Atlin.....22,23,24
Atlin area.....21
Atlin Mining Division.....18,33
Aucoin.....4,5,6
Australian Hill.....123
Axel, H.....107
Back Creek.....4
Backstrom, C.....90
Badlards Creek.....90
Ballarat Creek.....10,14,97,171
Ballarat Mines.....133,141
Ballarat-Tatlow Joint Venture.....133
Barduson Placers Ltd.....71,116
Bardwell, R.....94
Barwell.....4,5
Barker Creek.....3,4,5,6,10,13,14,107,171
Barker Creek Placer Expl. Co.....107
Barlow Creek.....4,111
Barney Pup.....4,113
Bates Creek.....171
Battleford Creek.....4
Bazylinsky, T.....114
Beach, R.....116
Bear Creek (Klondike)...4,5,10,13,14,27,30,159,160,171
Bear Creek (McQuesten).....121,171
Bear Creek Valley.....159
Bear Creek Ventures.....160
Beck, L.....149
Bedard, G.....133
Bedrock Creek.....2,4,13,14,95,171
Belcher Gulch.....4
B.E.L. Yukon Establishment.....164
Bennford Mining.....141
Berg, S.....155
Berger, F.....150
Beron Placers.....144
Beyer, L.....150
Band H Mining.....128
Big Creek.....13,14,93,114,171
Big Creek area.....94
Big Gold Creek.....4,10,13,14,164,165,171
Big Salmon River.....13,14
Bismark Creek.....4
Black Hills Creek.....4,5,10,13,14,106,107,171
Blackston Placer Mining Ltd.....114
Bleiler Placer Ltd.....114
Blueberry Creek.....4,108
Bodine, Dr. A.G.....15,19,22,23,25
Bonanza Creek.....2,4-6,10,123,130,132,136
.....141-146,148-151,171,172
Bonanza Creek Benches.....10
Bonanza Creek Valley.....154
Bonanza Mining Co.....144
Bonar Young Mining Co.....148
Bordon Creek.....98
Boucher Creek.....4,5,6,172
Boulder Creek.....4,10,154
Boulder Hill.....154
Bourdeleau Gulch.....4
Box Creek.....4
Bradley, T.....89
Braun, R.....87
Bremnar, I.....125
Brennan.....4,6
Brimstone Gulch.....138,139
Brisebois Bros. Const. Ltd.....96
Brisebois, C.....96,97
Brisebois, M.....96
Brown, F.....90
Brown, J.....132
Brownlee.....6
Bryan Bench.....125
Bryde, J.....148
Bullion Creek.....4,10,172
Bunka, W.....170
Burgleman, G.....132
Burwash Creek.....4,10,13,14,87-89,172
Butterworth, L.....1
Butler Gulch.....4
Bverge, D.....111
Cabin Creek.....4
Cadillac Expl. Ltd.....153
Calder Creek.....142,172
Caley, G.....145,152
California Creek.....4,166,172
California Gulch.....4
Campbell, R.....2
Canadian Cordillera.....18,21
Canadian Creek.....10,13,97,172,173
Canada Tungsten Mining Corp. Ltd.....79,80,114,115
Can-Pat Expl. Ltd.....97
Canyon Creek.....10
Capital Dynamics.....101,102,163
Caribou Creek.....4,5,10,13,14,132,133,173
Caribou Placer District.....2
Carlson Creek.....13,14,120,121,173

Carmacks Fork....148
Carmacks, G....2
Cascade Creek....4,19,74
Cascade Creek Delta....19
Cassiar Asbestos Corp....125
Cassiar Bar....2
Cassiar Mountains....21
Cautley....4,5,6
Center Creek....4
Chapil, F....149
Charlie, Tagish....2
Cheechako....10,151,152
Chief Gulch....144
Childs Gulch....4
Chilkat Indians....2
Chilkat Pass....2
Christal Creek....4
Chumar Placers....102
Churchill, T....90
Cand I Const. Ltd....116,117
Claffey Pup....10,141
Clarke Creek....4
Claymore Resources Ltd....103
Clear Creek....3,4,10,13,14,30,32,45,111-114,173
Clear Creek area....13,43
Clear Creek Gold Mines....113
Clear Creek Valley....45,112
Clinton Creek....125
Coast Mountains....21
Cogasa Mining Corp....164
Close, A....127
Coles, R....93
Colorado Creek....127
Colp, Douglas B....35
Comex....54,57
Conditt, K....148
Conglomerate Creek....4
Connors, M....163,164
Consolidated Mines Yukon Ltd....136,137
Conway, A....148
Cote....4,5,6
Courtland Creek....4
Coombs, D....19,148
Cooper Creek....87,173
Cooper Creek Mining Co....87
Cottoneva Creek....4,13,14,173
Cracker Creek....17
Craig, D.B....1
Crawford, G....126,159
Cripple Hill....22,156
Crockett, M....128,140
D'Abbadie Creek....67
Dago Gulch....4
Dago Hill....10,30,123-125
Dalton, J....3
Darron Placers....79
D.A.S. Co. Ltd....89
Daunt, K....151
Davenport Creek....17
Davidson Creek....10,13,14,73,173
Davy, R....111
Dawn Creek....13,14,73,173
Dawson City....2,21,23,28,43-45,113
Dawson Mining District....8
Dawson Mining Equip. Ltd....77,80,111
Dawson Range....3,21
Debicki, R.L....1,18
Delta Smelting & Refining Co. Ltd....13
Dezadeash area....3
Dickson....4,5,6
Dion Gulch....4
Dip Creek....97
Discovery....15,129
Discovery Creek....13,14,94,129
Discovery Gulch....4
Discovery Hill....125
Discovery Pup....159
Djukastein, K....80,93,94
Dollis Creek....10,13,17,18,99,101,173
Dolly Creek....4
Dome Creek....124
Dominion Creek....4,5,6,10,13,14,26,44
....125,131-138,173,174
Dominion Placers....135
Donjek River....13,14,87
Downen, S....143
Dredge Creek....118
Dredge 8....125
Dredge 10....125
Dublin Gulch....10,13,14,174
Dvensing, D....27,79,115,121
Duke River....89,90
Dumais....5
Duncan Creek....3,4,5,6,10,13,14,71,72,174
Eagles Nest....74
Edmonton Creek....4,174
Edwards, D....154
Eight Pup....4
80 Pup....4,10,127
Eikland, C....90
Eldorado Creek..2,4-6,10,13,14,143-147,151,152,174,175
Eldorado Creek Benches....10
Eldorado Creek Valley....143
Eldorado Mining....144
Eldorado Placers....144
11 Pup....149
Eliza Creek....5
Elkhorn Resources....147
Emonds, D....117
Enchantment Creek....175
Erickson, J....129,136,137
Erickson, P....130
Erl, F....117
Eureka Creek....5,10,13,14,137,175
Examiner Gulch....5
Excellsior Creek....13,14,175
Falconer Gulch....5
Faucher, E....165
Favron, P....124,138
Favron, S....124
Fellhawk Placers....165
Fifteen Pup....5,80,81
Fifty-one Pup....5
Fish Creek....5
Fisher Creek....5
Firth River....13,14,169
Five Mile Creek....5
Flat Creek....5,13,14
Flick, D....71
Flume Creek....104
Flynn, M....87
Foot, B....71
Fort Reliance....2
Forty Mile 2
Forty Mile River....2,10,14,163
49 Gulch....154

49 Hills.....154
Forty Pup.....5
Fort Selkirk.....2
Forum Resources.....135
Fosse, D.....149
Foth, P.....156
4-M Mining.....123
Fourth of July Creek.....5,13,14,90,175
Fox Gulch.....5,159
Frances River.....2
Franklin, G.....146,166
Fraser, J.....127
Frazer Resources Ltd.....104
French, C.....71
French Gulch.....5,146
Friday Gulch.....139,140
Friesen, E.....73
Fritz, T.....126
Fry, A.....147,151
Fry, D.....147,151
Fuerstner, M.....67
Gatenby, G.....134
Gatenby, L.....134
Gauvin Gulch.....5,10,144
Gay Gulch.....2,5,10,144,145
Gay Gulch Valley.....144
Geese, E.....147
Gem Creek.....114,115,175
Gem Resources.....131,132
General Mining.....113
Genier, A.....115
Genier, L.....113
Gervais, G.....71
Geysler, P.....143
Giant Yellowknife.....25
Gibbon.....4,49
Gibson, R.....139
Gilbert, G.....45
Gilchrist, T.....123,124
Gill Gulch.....80
Glacier Creek.....2,5,10,13,14,157-160,175
Glacier Creek Gold Co.....160
Glacier Creek Placers.....159
Gladstone Creek.....175
Gold Bottom Creek.....2,5,10,13,14,127,128,176
Gold Bottom Placers.....127
Gold Creek.....116
Gold Creek Mining.....97,98
Goldfield Canada.....153
Golden Gulch.....144
Gold Hill.....141
Goldmark Minerals.....103,104,107,108
Gold Run Creek.....5,10,13,14,135,136,176
Gold Run Creek Valley.....135
Gold Run Investments Corp.....136
Goldwin Joint Venture.....103
Gonder, D.....67
Gordon, W.....118
Goring Creek.....5,10
Gould, D.....127
Graner, D.....138
Granite Creek.....90
Granite Gulch.....5
Granville Joint Venture.....138,139
Granville Placers.....146
Grapes, K.....1
Graves, W.....144
Green.....4
Green Gulch.....140
Green Gulch Valley.....141
Greenwall Brothers Contractors Ltd.....142,143
Gritzka, D.....129,130,133,140
Groetschier Bench.....152
Guder, F.....93,94
Guder Mining Expl. Ltd.....93
Guimard, L.....159
Gustavus Ranges.....21
Guyshoro Gulch.....5
Haggart Creek.....2,4,5,10,13,14,79,80
.....115,116,118,119,176
Haggart Creek Valley.....80,81
Hakkon Placers.....137
Hakonson, G.....130
Hamilton, I.....131
Haner, L.....164
Hansen, W.....137
Hanulik, H.....124
Hanulik, J.....123
Happy Creek.....93
Harper, A.....2
Harper, N.....114
Harry Lemon Gulch.....154
Hattie Creek.....5
Hawk Mining.....149,153
Hawker Siddeley Canada Inc.....39
Hawkes, W.....149
Hawkins.....4
Hayden Creek.....118
Hayes Creek.....3,13,14
Helfrich Pipeliners.....65
Henderson Creek.....5,10,13,14,105,176
Henderson, R.....2
Henry Gulch.....5,10,123
Hester Creek.....5,126
High Gravity Resources Ltd.....146,154
Highet Creek.....5,6,10,13,14,117-119,176,177
Highet Creek Valley.....117
Hilchey, G.R.....50,54
Hinnek, W.....150,151
Hobo Creek.....13,14,114,115
Hodgen Creek.....5
Hofer, A.....71
Holbrook Dredging Co.....164
Holway, R.....121
Homestake Gulch.....5,10
Hootalinqua.....3
Hope Creek.....13,14
Hosack, G.....73
Hudson Bay Co.....2
Hug, J.....123
Hunker Creek.....4,5,6,10,13,14,23,30,123-127
.....129,130,136,138,142,177
Hunker Creek Benches.....10
Hunker Valley.....123
Hunter Creek.....134
Hunter, J.A.....43
Huot Gulch.....5
Hyland River.....2
Independence Creek.....10,126
Indian River.....4,5,10,21,24,44,137
.....142,143,177,178
Indian River Valley.....24
Irish Gulch.....10,147
Irish Hill.....147
Iron Creek.....5
Isaacs Gulch.....5

Istchenko, R.....85
Italian Creek.....5
Jackson Hill.....30,44,45,157,158,178
Jackson Gulch.....5,10
Jarvis River.....5,83,85
Jasper Creek.....17
JBSCH Mining.....89
Jellet, J.....135
Jensen Creek.....135
J-Nor Enterprise.....93
Johnson Creek.....10,13,14,116-119,177
Johnson, D.....144,159
Johnson, L.....105
Jones, G.....88
Jones Gulch.....5
Jones, W.....87
Josephine Creek.....13,14,177
Jubilee Mountain.....65
Kajo Placers.....135
Kaskawulsh River.....5
Keech, D.....145
Kelsey Expl. Ltd.....137
Keno City.....71
Kenyon Creek.....103
Kerr, G.....138
Keystone Creek.....5,177
Kimberley Creek.....13,14,83,85
King Solomon Mines.....147,151
King Solomon Mines' Gold Hill.....10,152
Kirkman Creek.....10,108,177
Kirkman, M.....101
Kinakin, M.....130
Kitchener Creek.....5
Kitto.....5,6
K&K Mining.....155
Klein, G.....45
Klondike.....3
Klondike area.....2,13,14,43-45
Klondike Gold Rush.....2
Klondike Mining Co.....150,154
Klondike Placer Miners Assoc.....1
Klondike Plateau.....21
Klondike River.....2,4-6,14,23,26,30,157-159,178
Klondike River Valley.....23
Klondike Vault Mining.....131
Klondike Vault Placers.....126
Kluane Resources.....87
Kluane River.....4
K.M.A. Mines.....154
Kolody Enterprises.....150
Kostem Resources.....166
Kostuta, T.....126
Krueger, H.....138
Lake Creek.....5,10,13,14,67,178
Land Use.....16
Langevin, L.....148
Langevin, M.....148
Lamontagne, J.....101,144
Last Chance Creek.....5,10,13,14,124,125,178
Laurenson, D.....126
Lazotte, R.....113
Ledge Creek.....5,10,13,14,74,178
Ledge Creek Delta.....74
Lee, G.....123
Lee's Jade & Opals Ltd.....107
LeFebvre, F.....87
Left Clear Creek.....112-115
LeMoignan, G.....89
Lepine.....5
Lewis, B.....1
Lewis Gulch.....114
Liard River.....14
Liedike, H.....136,137
Lightening Creek.....5,10,13,14,71,178,179
Limestone Creek.....77
Lindow Creek.....5,160
Lion Gulch.....5,133
Liske, B.....74
Litchfield Mining.....111
Little Atlin Lake.....65
Little Blanche Creek.....5,10,141
Little Dominion Creek.....131
Little Eldorado Creek.....146
Little Gold Creek.....13,14,166,179
Little Skookum Gulch.....6,151
Little South Klondike River.....14,114
Livingstone Creek.....6,10,14,23,67,179
Livingstone Creek area.....13
Log Cabin.....10
Lombard Pup.....10
Lone Star.....149
Lousetown Bench.....158
Lovett Gulch.....6,10,157
Lovett Hill.....22,157
Lower Bonanza Creek.....10,13
Lower Dominion Creek.....10
Lower Hunker Creek.....10
Lower Nelson Creek.....74
Lower Sulphur Creek.....10
Lucky Creek.....6,130
Lucky Lady Placers.....139
Lunde, O.....128
Lynch, J.....166
Mae-Bry Mines.....150
Magnet Gulch.....6
Magnum Enterprises.....129
Main Street Mining.....123
Maisy May Creek.....13,14,106,179
Maisy May Creek Valley.....106
Maisy May Mines.....106
Malicky, W.....80
Malifair, J.....163
Manson, G.....80,81
Mariposa Creek.....6,10,97
Marten Creek.....163
Martin Creek.....14,83
Masters, K.....156
Matson Creek.....10,13,14,103,104,179
Matson, J.....104
Mayo.....19,21,23
Mayo, A.....2
Mayo area.....13,72
Mayo Creek.....4
Mayo Lake.....5,6,19,23,73,74,179
Mayo Lake area.....10,14
Mayo Mining District.....8
Mayo River.....4,6
McArther Ranges.....21
McCauley, B.....93
McCrory Holdings.....87
McDonald.....4
McDonald Lake.....6
McDougall, C.....163,164
McIntyre Creek.....119,179
McKay Gulch.....6,149
McLagen Creek.....120,179

McPherson....4,5,6
McQuesten, J....2
McQuesten River....3,4,5,13,14,21
McRae Gulch....6
Meadow Gulch....140
Meadow Placers....140
Mechanic Creek....93
Melanson, M....87
Meredith, C....156
Meyer Properties Inc....73,74
Miben Mining Co....123-125
Middle Bonanza Creek....10
Middle Dominion Creek....10
Middle Hunker Creek....10
Middle Sulphur Creek....10
Miller Creek....2,6,10,13,14,25,26,30
....101-103,163,164,166,179
Miller Creek Ditch....103
Miller, D....88
Miner, K....74
Mint Gulch....6,10,129
Minto Creek....5,6,13,14,119,120,179,180
Minto Lake....23,120
Mogenson, G....87,89
Monfette, J.P....143,147,148
Montana Creek....4,5,6,10
Monte Cristo Hills....153
Monte Cristo Gulch....10,154
Moose Creek (Fortymile River area)..6,10,13,14,163,180
Moose Creek (Livingstone Creek area)....180
Moose Creek (Tagish Lake area)....65
Moosehorn Range....10,13,14,18,103,180
Morgan, D....141
Morin, J.A....1,103
Morison, S....1,45
Moritz, H....93
Morrison Creek....116,180
Mount Cockfield....98
Mount Freegold....94
Mummie Pup....131
Mynot, S....135
Nansen Creek....4,5,6,13,14,94,180
N.B. Cook Corp....104
Nelson Creek....74,180
Nelson Gulch....6
Nevada Creek....133,134
Newbauer Creek....6
Nicholson, C....155,157
Nigger Jim Gulch....6,150
19 Pup....6,141,142
Nisling River....4,6
No Name Creek....6
Noranda Expl. Ltd....77
North American Trading & Transportation Co....164
North Big Salmon River....67
North Henderson Creek....105
North Klondike River....23
North Ladue River....23,24,40
Northwest Consolidated Industries Ltd....126,128,152
Norwest Placer Operators Ltd....157,158
Not Much Gold Creek....127
Nugget Drilling....6,71,72
Nugget Gulch....145,146
Oblak, F....126
Ogilvie....2,4
Olsson, M....163
O'Neil Gulch....6,150
Oro Fino Hill....153
Oro Grande Creek....13,14
Oro Grande Gulch....10,145,146
Ottawa Dept. of Energy Mines & Resources....15
Owl Creek....180
Oud, B....130
Panterra Resources....166
Paradise Hill....10,126
Parent Creek....6,72
Parkes, R....169
Parnell....4,5
Patton Gulch....97
Paydirt Holdings....115
Pedlar Creek....97,180
Peel River....2
P.J.J. Mining....97
Pelland, A....73
Pelly River....2
Perunovic, L....126
PeterKiss Oilfield Const. Ltd....119,120
Pilote, M....120
Ping Pong Creek....180
Placer Claims....8
Placer Deposits....18
Placer Gold....10,12
Placer Leases....7,8
Placer Mining....9
Porcupine River....2,14
Portland Creek....133
Potato Hills....79
Preacher Creek....6
Preido Hill....125
Preido Mines Ltd....14,124,125
Prince Albert Mines Ltd....149
Prohaska, S....101
Ptarmigan Creek....90
Pullan, S.E....43
Punters Gold Expl....111
Pure Gold Gulch....155,156
Pyroxene Mountain....97
Quartz Creek....2,5,6,10,13,14,141,142,143,180
Queenstake Resources Ltd....32,79,106,107,112,113
Quill Creek....87
Rabbit Gulch....6
Randler Gulch....6
Randolph, D....111
Rasmusson, W....141
Ray Gulch....79,80
Ready Bullion Creek....10,180
Ready Bullion Gulch....19,147
Reimer, K....89
Revenue Creek....13,14,93,181
Rinfret....4,6
Rintoul, D....135,146
Risby & Sons Mining....142
Ritter, A....80
R & L Mining Co....141
R & M Consultants Inc. (1982)....31
Rock River....5
Roe, G....144
Rogers Gulch....128,129
Ross, L....108
Ross Mining Services Ltd....136
Rouleau, B....128
RPM Mining....104
Ruby Creek....24
Rude Creek....13,14,97,181
Rudniski, S....144
Rudolph Gulch....6

Rudolph Pup....117,118
Rusk Creek....6
Russell Creek....77,181
Russell Creek Valley....77
Sabboth Creek....116,117
Sailor, A....134
Sailor, N....134
Savoya Hill....126
Savoya Hill Mines....126
Sawyer, C....85
Sayyea Creek....2
Scheelite Dome....116
Scheelite Gulch....117
Schmidt, H....166
Schneider, F....124
Schomig, F....80
Scott, W....113
Scroggie Creek....3,4,6,10,13,14,97,107,181
Seattle Creek....13,14,115,116,181
Secret Creek....96,119
Selwyn Mountains....21
Sestak Creek....14,105
7 Pup....149
Sevosik, E....80,119
Seymour Creeks....93
Sharpe Creek....6
Shaw Creek....6
Shaw, G....128,129
Sheep Creek....13,169
Sigmma Properties Ltd....157
Siguardson, K....152,153
Sikanni Oilfield Const. Ltd....90,163
Simcox, J....123,124
Simmons, J....89
Simpson, C....135
Simpson, J....145
6 Below Pup....128
Sixty Mile River....2,4,5,6,10,13,14,24
....101-105,163-166,181
Sixty Mile River area....21
Skookum Gulch....6,13,151
Skookum Jim....2
Slims River....4
Slate Creek....6
Snag River Placers....88,89
Snake River....120
Snyder Creek....90
Sock Creek....6
Soda Pup....128
Sonora Gulch....13
Sourdough Hill....155,156
Sourdough Gulch....2,155
South Big Salmon River....4,23,49,67
South Big Salmon River Valley....23,67
South Nelson Creek....74
Sprague Creek....115,181
Spriggs, D....163
Spring Gulch....6
Sprokkreeff, N....140,141
Spruce Creek....21,23
Squaw Creek....10,13,14,83,112,181
Squaw Creek Mining....112
Squirrel Creek....13,14,89,182
Stardust Mining Ltd....116
Strallabrass, I....1
Steele River....4,5,6
Steep Creek....6,10,13,14,73,74,182
St. Elias Mountains....21
Stevens Creek....6
Stevenson, G....146
Stewart, M....120
Stewart River....2,4,6,10,13,14,19,182
Stoddart Creek....13,94,182
Stone, B....101
Storing, D....98
Stowe Creek....6
Stuart, J....132
Sulphur Creek....6,10,13,14,24,44,125
....136,138-141,182
Sulphur Gold Placers....140
Summit Creek....14,67,182
Sundance Gold Ltd....112
Supervising Mining Recorder....16
Sveen, J....119
Swede Creek....80,115
Szutiak, D....117
Takis, T....80,119
Tamandara Resources Ltd....115
Tardiff, J....88
Tatamagouche Creek....87,88,182
Tatlow, K....123
Taylor, F....72
Taylor, J.P....133
Teck Corp....138,139
Teck Mining Co....44,45
Telluride Creek....85
Temperance Hill....127
Temple, D....90
Tempelman-Kluit, D....25,125
Ten Mile Creek....6,10,13,14,104,105,182
Territorial Gold Placers Ltd....97,101,102,105
....106,132,133
Teslin River....2
Thirteen Gulch....6
37 Gulch....4
3734 Yukon Ltd....135
Thistle Creek....4,6,10,13,14,107,108,182,193
Thunder Gulch....10,13,14,71,183
Tic Construction....89,90
Tierman, P....121
Tintina....21
Too Much Gold Creek....13
Trail Gulch....6,156
Trail Hill....10,22,156,157
Trainer, V....166
Tremblay, L....88
Trerice, W....105
Tri-Agency....24
Triple E Mining....67
Troberg, R....154
Tuck, W....118,120,121
Tundra Contracting....147
Turnbull, M....88
Tveter, F....71
Twelve Mile Creek....6
Twenty Gulch....6
Twenty-one Gulch....6
218171 B.C. Co. Ltd....159
2540 Yukon Ltd....88
2595 Yukon Ltd....87
2870 Yukon Ltd....166
Ukrainetz, R....129
Universal Expl. Ltd....44,157,158
Unknown....155
Unnamed Creek....73,93,116
Upper Bonanza Creek....10,13,19,150

Upper Dominion Creek....10
Upper Hunker Creek....10
Upper Sulphur Creek....10
Vail, J....145
VanBibber Placer Development....90
VanKlaveren, P....89
Van-Sea Investments Co. Ltd....97
Various Creeks....13,14
Ventures West Minerals Ltd....142
Vermont Creek....6
Vezina, L....149
Victoria Gulch....6,148,149,183
Waiste, J....151
Walhalla Creek....4,6,107
Watson Lake Mining District....8
Watson, P....1
Webber Creek....6
Weigand, W....145,152
Welter....4,5,6
Westwardlands Ltd....158,159
Wheaton River....13,14
Whiskey Hill....128
White Channel Gold....143
White-Fraser....5
White Pass Railway....2
White River....2
Whitehorse....3,21,22,43
Whitehorse Dept. of Energy Mines & Resources....15
Whitehorse Mining District....8
Whitehorse Surveys & Mapping Branch....15
Whitlingham, B....45
Wierda, J....138
Widmeyer, S....130
Wiez, E....72
Wild Boar Enterprises....119,120
Wilson, K....93,94
Wilson, G....94
Williams Creek....6,72
Willis, J....71
Wolf Resources....74
Woolsey, W....88
Wozniak, L....73
Yardley, G....83
Yaremicio, W....101,102
Yates, W....83
Yoder, H....152
Yost, J....40
Yost, M....40
Yukon Consolidated Gold Corp. Ltd....3,113
Yukon Consolidated Gold Corp. Dredge 6....136,137
Yukon Consolidated Gold Corp. Dredge 8....138
Yukon Consolidated Gold Corp. Dredge 10....135
Yukon Dept. of Consumer & Corp. Affairs....16
Yukon Explorations Ltd....164
Yukon Gold Holdings....83
Yukon Gold Placers Ltd....108
Yukon Placer Deposits....11,13
Yukon Placer Mining Industry....7
Yukon Plateau....21
Yukon River....2,4,5,6,24,44,97,105,108,158,159
Yukon Territory....3,12,15,18,21,23,28
Yukon Territory Water Board....16
Yusesyo River....2
Zinc Creek....111